

# Building Equity in Technology



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# AI for Accessibility

Pushing the limits  
of what AI can do  
in accessibility



# AI for Good

Empowering the people working to solve humanity's greatest issues



AI for  
Accessibility

AI for  
Earth

AI for  
Humanitarian  
Action

AI for  
Cultural Heritage

AI for  
Health

# The 'Disability Divide' is widening

## The Disability Divide

The gap in societal inclusion for people with disabilities, including in education, employment, and access to technology.



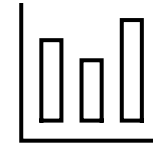
### Disability numbers are growing

- Long-term COVID-19 health consequences ('long-haulers')
- Mental health conditions are increasing
- World population is aging



### The employment divide is worsening

- Unemployment rates for people with disabilities have been disproportionately impacted by the pandemic



### Education gaps are increasing

- People with disabilities consistently have lower levels of education than their peers

# Making AI systems more inclusive



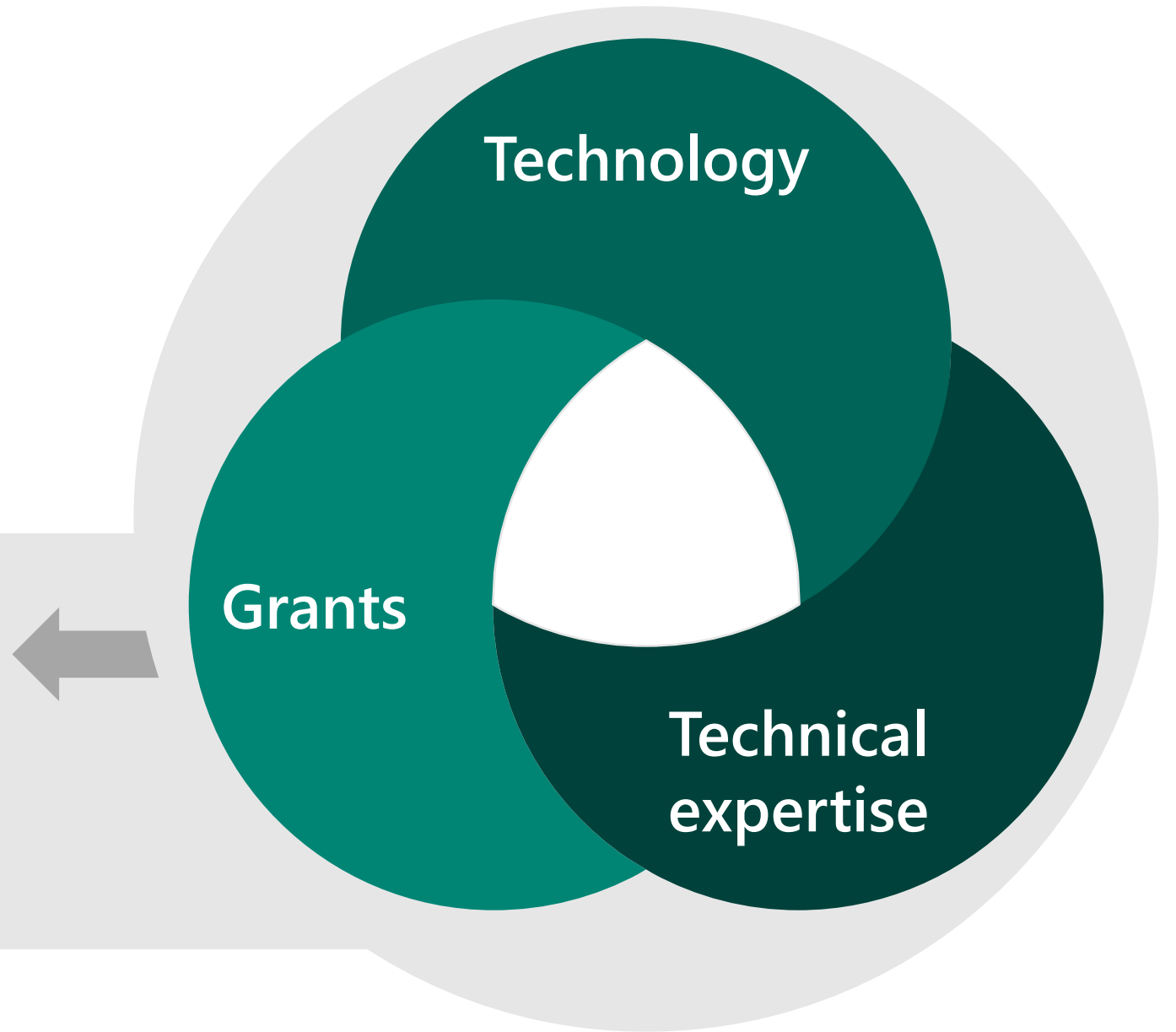
## Shrinking the 'data desert'

- Lack of datasets that represent or include people with disabilities is common problem for researchers and developers
- AI algorithms that aren't trained on inclusive data often don't work well for people not in that dataset
- We must improve the fairness of systems when it comes to gender, race, and disability
- AI systems built *by and with* disability community will reflect a wider spectrum of users, leading to greater innovations for everyone

# AI for Accessibility

A 5-year, \$25 million program to accelerate solutions that amplify human capability for people with disabilities

Empower researchers, startups, nonprofits, and assistive technology companies around the globe to push the limits of what AI can do in accessibility



# Focus areas



## Education

Ensure accessibility of learning materials, language development, and assistive technology options



## Employment

Attract, retain, and upskill talent with disabilities, including workplace accommodations



## Community

Improve personal connections to maintain relationships and mental health



## Home

Advance opportunities in appliances, healthcare, transportation, and safety



# Community



## Challenge

- Mental health is the top cause of disability in the world and a growing concern as a result of the pandemic.
- In many countries, the number of mental health professionals cannot meet demand.



## Opportunity

- AI can help people and their providers monitor, manage, and improve wellbeing, as well as facilitate connection.
- We are investing ideas that:
  - Nurture connection
  - Deepen personal relationships
  - Protect mental health





# Community

## Featured Project: Empathetic rewriting

### Facilitating empathic conversations in online mental health support

Researchers at the University of Washington are working with TalkLife and Supportiv to train natural language models to recognize empathy in text-based messages, then offer suggestions to make responses more empathetic.

Location: USA



# Community

## Featured Project: Adaptive text messaging

### Meeting young adults where they are: via text message

Partnering with Mental Health America (MHA), Northwestern University and University of Toronto are developing an adaptive, AI powered text-messaging platform for interventions designed to deliver engaging, personalized support for young adults who may not seek formal mental health treatment.

Location: Canada and USA



# Community

## Featured Event: Supporting mental health in Black communities

**A discussion about biases, health care access, and the potential of technology**

Workshop explored the intersection of disability and race. Experts from across disciplines addressed how to improve representation in AI, increase mental health research from and in Black communities, and how AI can both help and harm Black people seeking mental health support. [Report](http://aka.ms/ai4amhreport): <http://aka.ms/ai4amhreport>

Location: USA



# Grant selection criteria



Developed *with or by* people with disabilities

**Relevance:** Built with AI/ML and Azure

**Impact:** Elevates education, employment, community, home

**Data:** Open to sharing (privacy compliant) data for future innovation

**Feasible and Sustainable:** Potential beyond year of funding

**Capable:** Team skills and knowledge

**Showcase:** A strong story to shift sentiment

# Join us on our journey

## Learn more

[AI for Accessibility – Microsoft AI](#)

## Apply for a grant

[AI for Accessibility Grants – Microsoft AI](#)

## Upcoming award rounds

### Employment

Requirements posted: early June 2021

Submission deadline: July 30, 2021

### Low-Cost Assistive Technology\*

Requirements posted: early October 2021

Submission deadline: December 17, 2021

\*Focus will be on improving access to assistive technology in communities outside the US



Thank you!



# GRIEVING ON THE DIGITAL STREET

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**Dr. Desmond Upton Patton**  
Senior Associate Dean, Columbia University  
Associate Professor of Social Work and Sociology, Columbia  
University  
Director, SAFE Lab

# Introduction

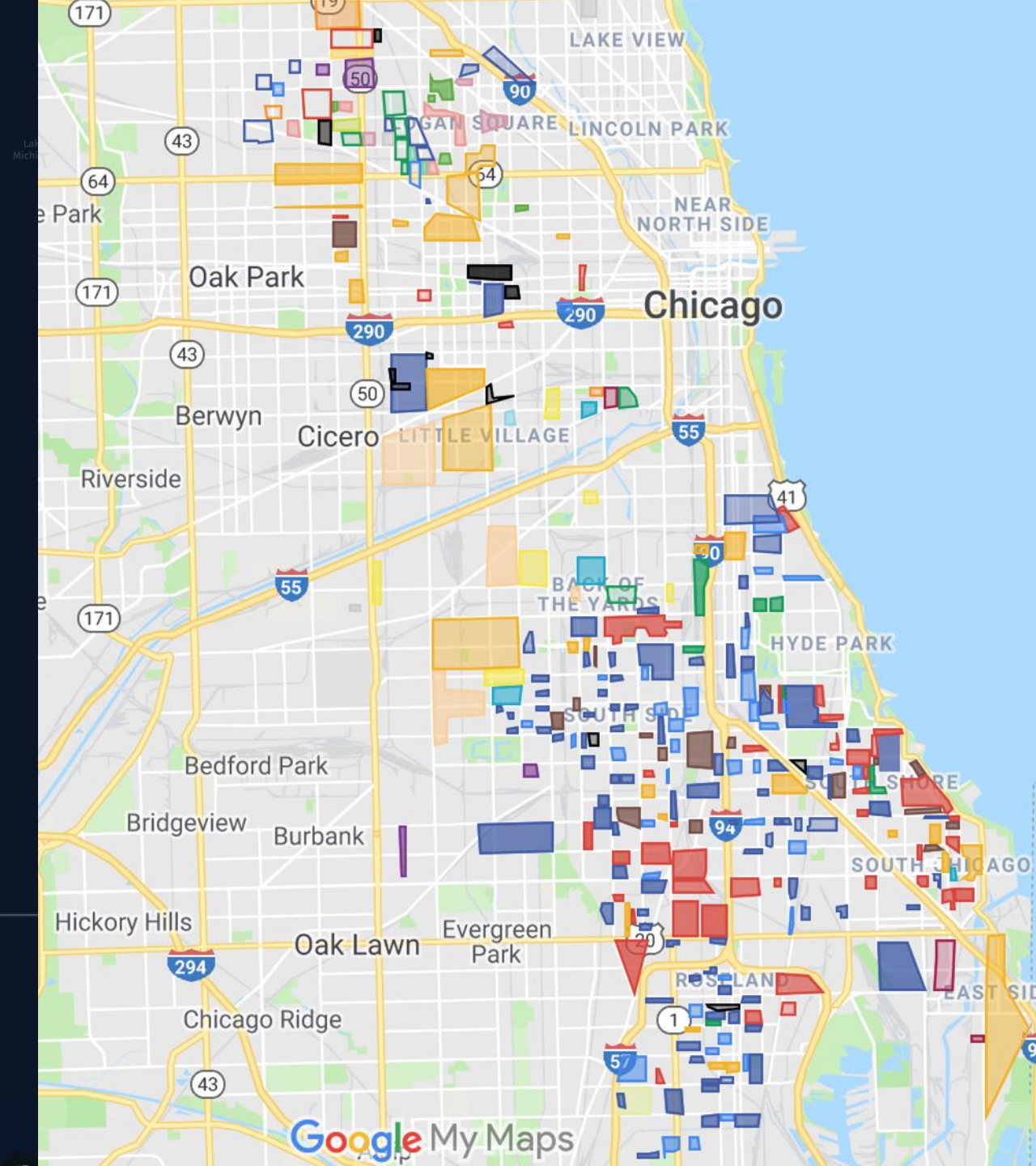
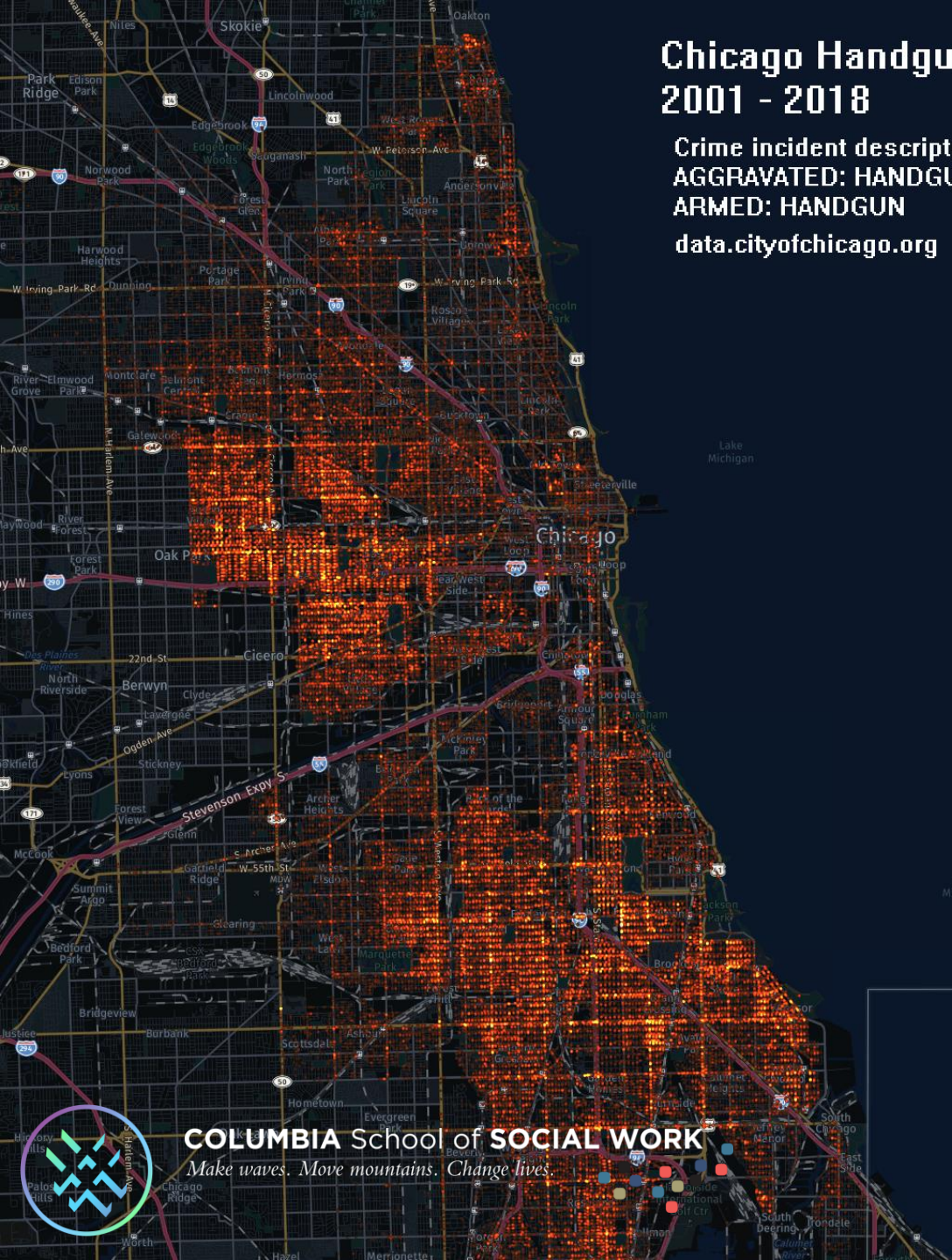
The SAFElab is a research initiative focused on examining the ways in which youth of color navigate grief and trauma on and offline by drawing on computational and social work approaches to research.





# Chicago Handgun Crimes 2001 - 2018

Crime incident descriptors  
**AGGRAVATED: HANDGUN**  
**ARMED: HANDGUN**  
[data.cityofchicago.org](http://data.cityofchicago.org)





## TEENS ON SOCIAL MEDIA

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**92%** ONLINE DAILY

**71%** USING MORE THAN ONE  
SOCIAL NETWORKING SITE

**45%** OF BLACK TEENS  
USE TWITTER

## Theoretical Background



**Young people in neighborhoods with high rates of violence use **social media to communicate** their lived experiences, including **trauma and violence.****

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Lil Shawtty got hit Up who Sung that #Bdk song. That shit Sad. But thats a fine example of how Internet drilling get u kilt. Smd R.I.p Jojo

4 Sep



JoJo got whacked???

4 Sep



I swear if I was Jojo's mama, Maugs would be dyin of all sorts of accidental deaths man... These kids have no concept of life n death...

6 Sep



"@DatNigga\_Billz: alot of bodies finna start droppin now that jojo dead #RipJOJO"

5 Sep



That shit crazy I just seen jojo ass on 73nd and may that saturday of my lil sis party tssss smfh

5 Sep



That boy jojo dat got killed , I seen him on the 4th downtown

6 Sep



"Thinking" this Chief Keef JoJo Lil Reese situation is gonna blow up into the national news

6 Sep

**PUBLIC ENEMIES**

# GRIEVING IN DIGITAL SPACE





CASE STUDY: **GAKIRAH BARNES**

# Gakirah's History of Loss



**NO SURRENDER LIL B**

@TyquanAssassin

Rip carlton tutu archer he one of da brothers  
[#STLAWRENCE](#)

12:12 AM - 9 Sep 2013

4 Retweets 3 Likes



**NO SURRENDER LIL B**

@TyquanAssassin

Tyquan Died I Lost My Mind 🙏 <sup>100</sup>

9:20 AM - 10 Feb 2014

2 Retweets 1 Like



**NO SURRENDER LIL B**

@TyquanAssassin

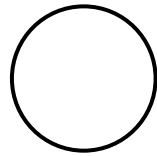
👑 Lil B 🙏💉

12:31 PM - 10 Apr 2014

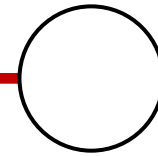
11 Retweets 12 Likes

# Methods

March 29, 2017



April 17, 2017



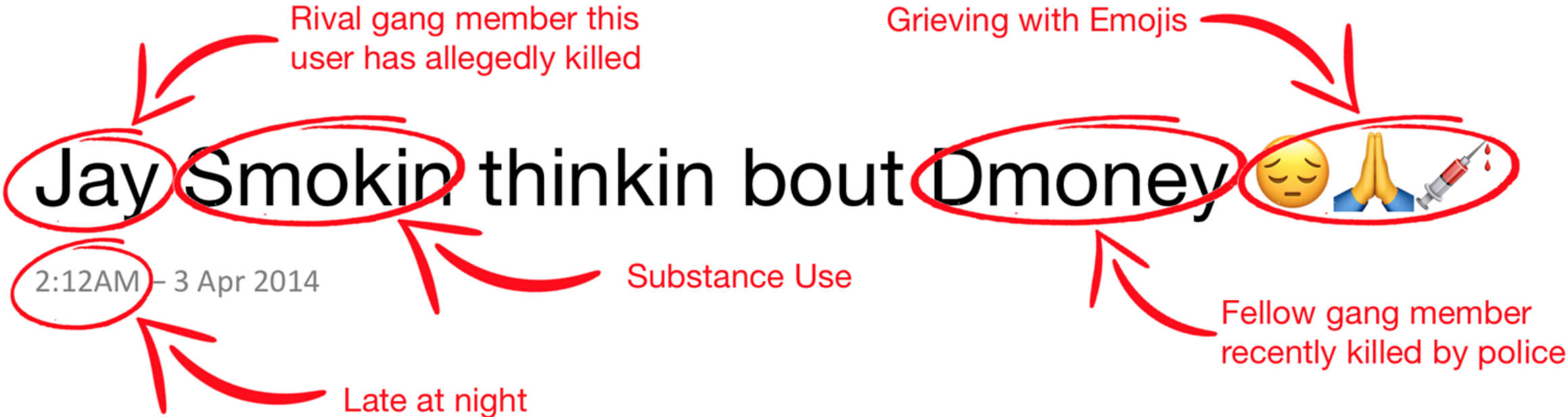
408 Tweets

**DEEP QUALITATIVE ANALYSIS**

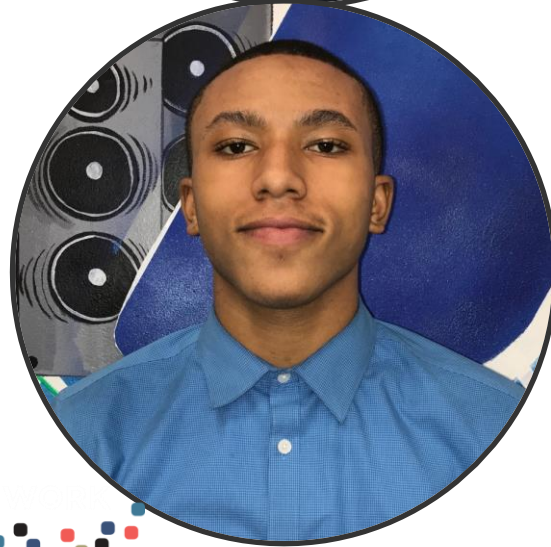
**NLP SUPERVISED MACHINE  
LEARNING**



# CONTEXTUAL ANALYSIS OF SOCIAL MEDIA (CASM)

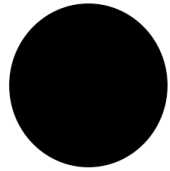


# DOMAIN EXPERTS



# Acute Grief

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[Redacted name]  
[Redacted handle]

@TyquanAssassin Why TF You Leave Us 😡  
Why Man I Swear This Ain't Really  
Happening .. I'm Finna T'UP 🐾🙏 Shit O V  
A

9:36 PM - 11 Apr 2014

# Anger and Retaliation

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DA Police I'd kill u Faster Dan niggaz on Da  
Corner Rip King Lil B 🙅🚓🚔👮🔫😞🙏

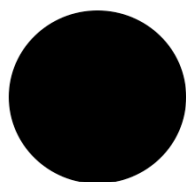
 CPDK

1:10 AM - 3 Apr 2014

15 Retweets 9 Likes

# Adaptation

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[Redacted name]  
[Redacted handle]

Thinkin bout Da first time Lil tyquan got sum  
[Redacted] my lil bro was happy asl 🙏🏻 🙏🏻

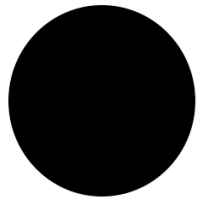
11:35 PM - 10 Apr 2014

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67 Retweets 70 Likes

# Accepting the Reality of Death

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In da end we DIE 🙏 100

10:53 PM - 10 Apr 2014




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671 Retweets 245 Likes

# **Natural Language Processing Analysis**

# Important Features

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**Rip** Boss Trell  
11:34 AM - 10 Apr 2014  
16 Retweets 8 Likes

   
  
Da Copz tried to take our whole organization  
Dwn 100 **Free** My Gang STLEBT  
11:20 AM - 28 Feb 2014

Feature	Weight	Occurrences
RIP	1.39	129
Free	1.07	16
Damn	1.02	35
🙏	0.93	84
R.I.P.	0.93	18

3 Retweets



# Future Potential

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**TWITTER COULD IMPEDE GRIEF PROCESS**

**SOCIAL MEDIA AS POTENTIAL CHANNEL OF SUPPORT**

**PAIRING QUALITATIVE AND COMPUTATIONAL APPROACHES  
FOR INTERVENTION AND PREVENTION WORK**

# QUESTIONS?

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@DrDesmondPatton





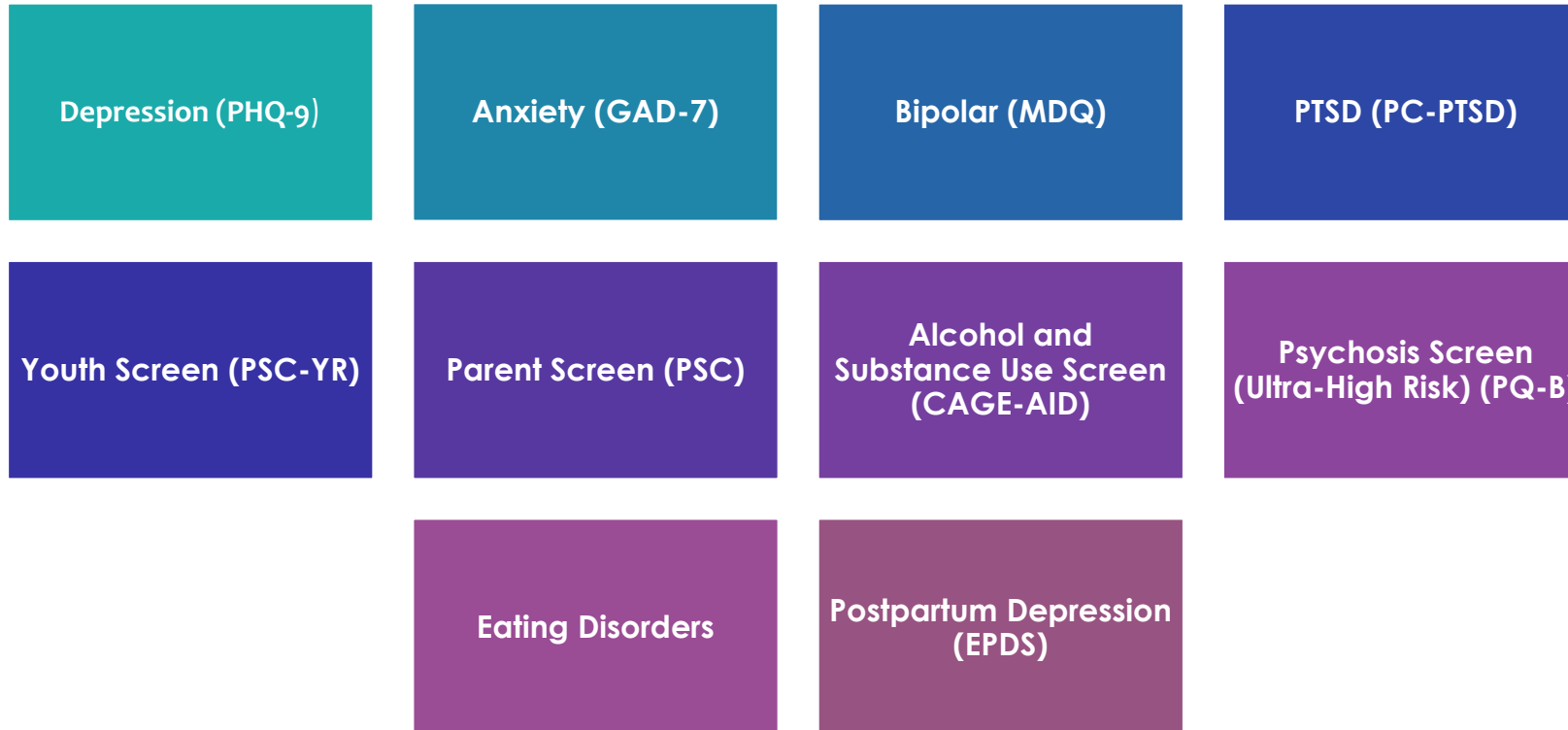
# AI and Mental Health: Building Equity through Co-Design

Theresa Nguyen, LCSW  
Mental Health America



Mental Health America  
**B4Stage4**

# MHA Screening ([www.mhascreening.org](http://www.mhascreening.org)): Over 9.8 Million Completed Screens



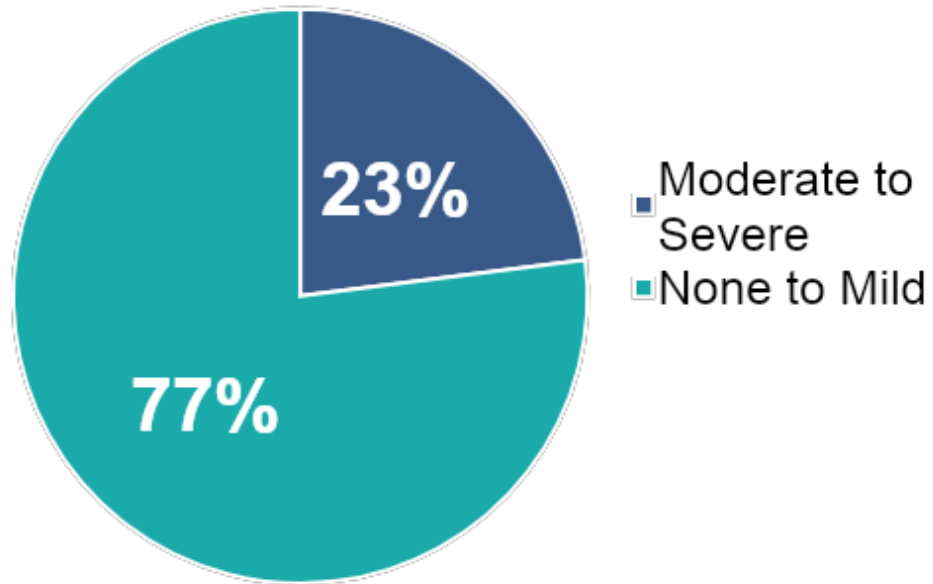
MHA Screening reflects the experiences of a help-seeking population that accesses mental health screening through [www.mhascreening.org](http://www.mhascreening.org). We do not reach the entire population; therefore our numbers are likely to underreport the actual experiences of the population.

# Overview of MHA Screening Demographics

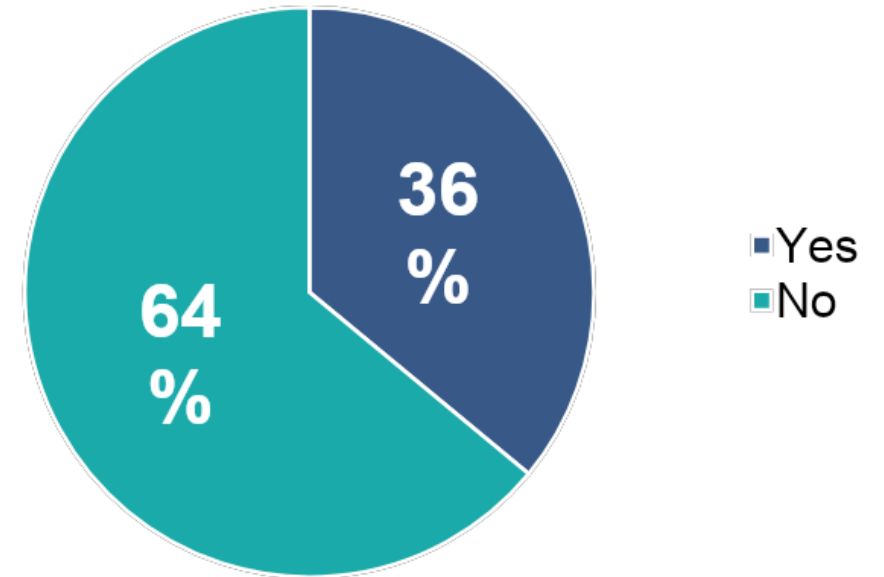
- **9 million** screeners since 2014;
  - Represent a help-seeking population for mental health conditions;
  - Help seeking increased dramatically in 2020
  - Expected reach in 2021: 4.5 Million
- 73% are female;
- Screeners screen more often for depression than any other condition;
- 47% identify as a racial/ethnic minority;
- 8% are international.
- In 2020, MHA results are consistent with the 2020 US Census Bureau Pulse Survey and CDC findings.

# High Severity, No Previous Support

Percent Scoring Moderate Severe for all Conditions



Have you ever received treatment or support for a mental health problem?



# What do People Want

- **Information** about mental health
- **Use at home** - worksheets or coping skills to
- **Online or mobile program** that can help you track or manage your symptoms
- **Referrals** to those that can help
- **Phone** number for immediate support

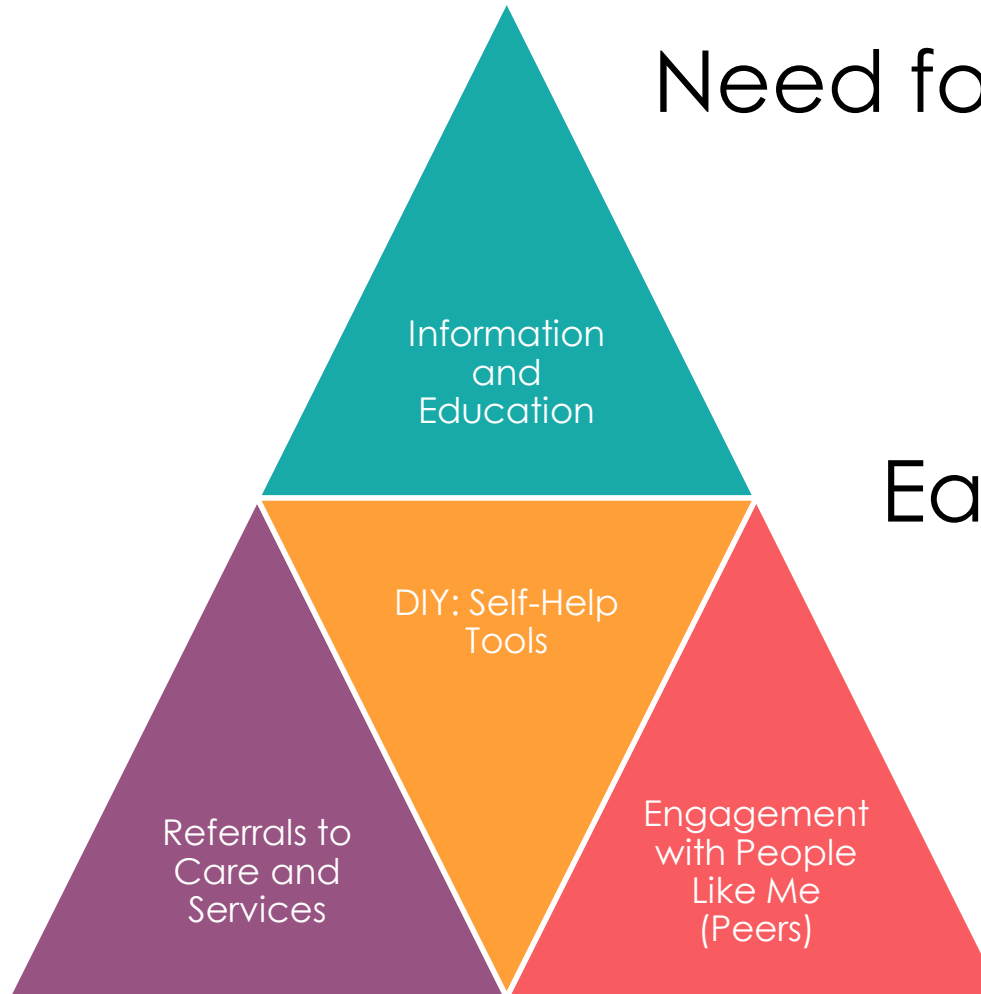
**48.55%**

**46.16%**

**45.25%**

**18.80%**

**13.74%**



Need for Co-Designed Technology

Specific to Early Intervention

# What Youth are Saying

"I feel so disconnected and confused and alone"

"Feeling so lost and alone"

"Never had enough help to know"

"Feeling like no one else is feeling what I'm feeling, or feeling like no one is there for me"

"...wondering what is wrong with me because no one else seems to feel this way"

"I know people who I fear risk suicide but I don't know how to help"

"Not knowing how to get help"

"I don't know what's happening to me but I need help. I'm not okay."



# Problem: Our Mental Healthcare System is Broken

**Mental Health Problems are common:** 20% of Americans each year have a diagnosable mental health condition

## **Treatment is hard to access**

24% receive adequate care; 29% receive inadequate care;  
55% receive no care

## **Burden is not equally distributed**

Racial, ethnic, gender minorities receive treatment less than half as often as Whites.

Young people less likely to want or receive treatment

120M people in Federally Designated Mental Health Treatment Shortage Areas.

# Building Equitable AI Solutions

- 1) Are we inclusive and representative?
- 2) Are we responsive to needs?
- 3) Are we making sustainable and systemic change?
- 4) Are we harming communities?

Responsible AI to Support Mental Health in Black Communities:

<https://aka.ms/MHReport2021>

Video from the meeting:  
<https://aka.ms/MHWSVideos2021>

AI for Accessibility Projects:  
<https://aka.ms/ai4a>

# Co-Designing Research

- Patient Participatory Research
- Community Participatory Research
- People are involved from the beginning
  - The idea development, the design of the research, the design of the product, findings, iterations, and final product
- Initial data from users, interviews, focus groups, crowdsourced materials.

# Our Mission

To create an accessible digital mental health service that is effective, fits easily into the fabric of people's lives, and is freely available.

# Our Team

David C. Mohr, PhD, (PI - digital mental health)

Madhu Reddy, PhD (Co-I - HCI)

Rachel Kornfield, PhD (Co-I - design & content development)

Jonah Meyerhoff, PhD (postdoc)

Joseph Jay Williams, PhD (co-PI - CS)

Sam Maldonado (Software Engineer)



Theresa Nguyen, LCSW (Stakeholder)



NORTHWESTERN  
UNIVERSITY



# Aims

Design and pilot an automated text messaging service to support common mental health problems (depression and anxiety).

Why text messaging:

- Apps have low engagement (top 30 apps have 97% abandonment in first two weeks).
- SMS app is most used app on a phone.
- Fits into fabric of user's life

# Objectives

1. **Design**
  - Understand MHA users
  - Co-design messaging strategy
2. **Develop**
  - Infrastructure for automated messaging and machine learning.
3. **Pilot** 2-week version
  - 50 MHA users
  - 200 MHA users

# What We've Done: Co-Design Process

- Recruit young adults completing mental health screeners on MHA website
- Represent diversity of MHA user population (gender, race, ethnicity, etc)
- A range of levels of participation depending on interest and comfort
- Entirely remote
- Allow for and encourage interaction with one another



2 online, asynchronous discussion groups with ~30 young adults each, plus individual phone interviews with most participants



Design workshops with a subset of 9 participants (Zoom)



48 participants used a Wizard-of-Oz prototype of a texting intervention for 1-2 weeks, and gave feedback in individual interviews

# Learnings: Who is the MHA user?

- Pandemic has been an added stressor
- Want validation that their experiences are common, but without dismissing their seriousness
- Formal help-seeking is not seen as appealing or within reach, largely due to costs and preferences for self-reliance
- Interested in learning new self-management skills, and rehearsing some they know about but that aren't at the top of mind
- Many have used mental health apps but have not sustained engagement

51

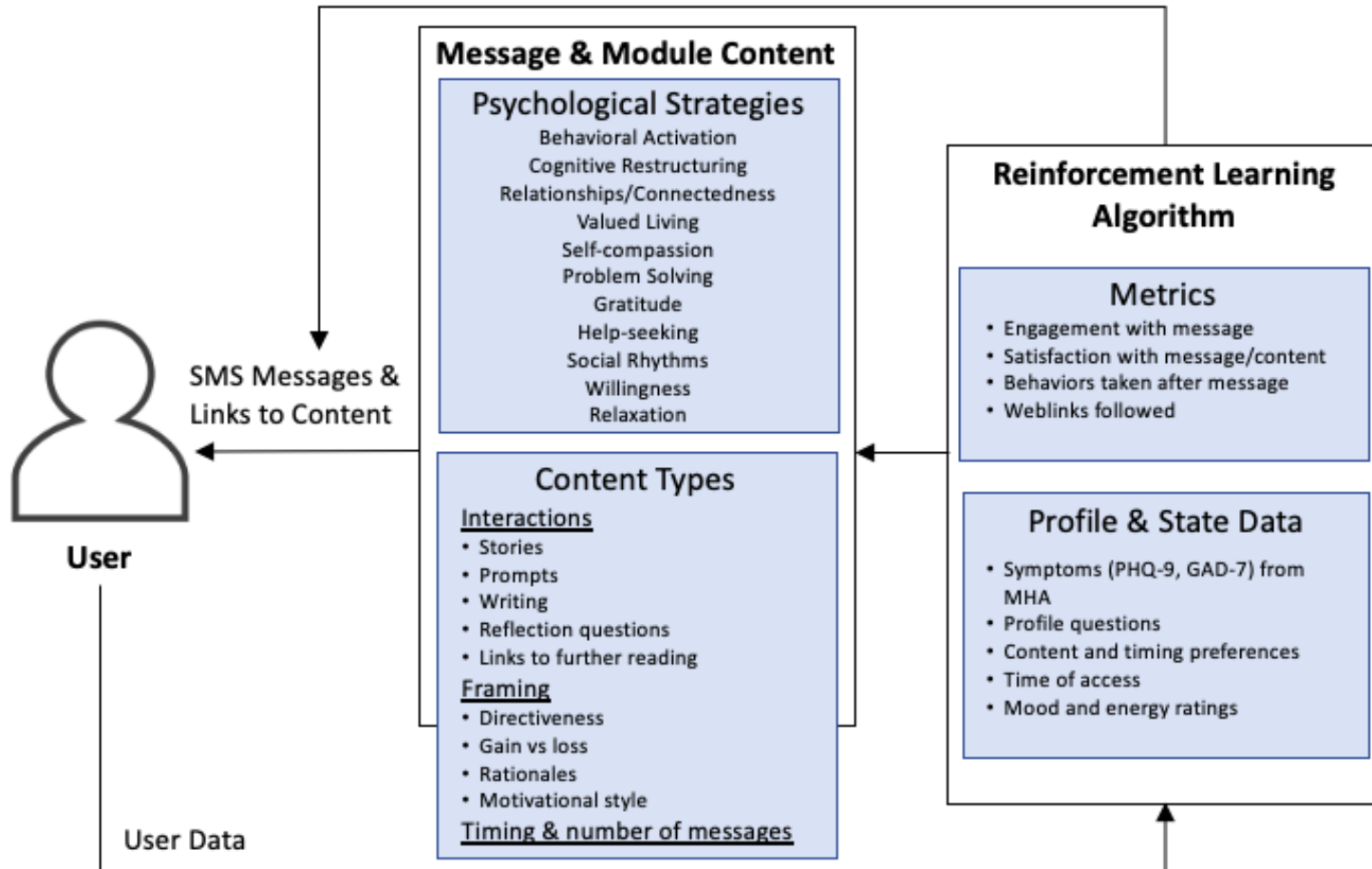
# Learnings: What users want in a digital tool

- Make interactions simple, but allow for engaging more deeply based on time and motivation
- Present the tool as a scaffold for self-help
  - *Give users agency to make choices and provide feedback*
  - *Allow for low-stakes experimentation with diverse content*
- Bring in peer perspectives

52



# Design Preview: Automated Messaging Program



- Open source bots to deliver messages via SMS
- Provide **diverse content**
  - *Psychological strategies*
  - *Interaction types*
- Collect user **responses and preferences** so that the system gives users more of the kind of content they like over time
- Will be available for **free** through Mental Health America<sup>53</sup> to users who take their mental health assessments

# Learnings: High User Engagement

## Daily Engagement

### Prompts

86% replied at least once/day

### Stories

86% replied at least once/day

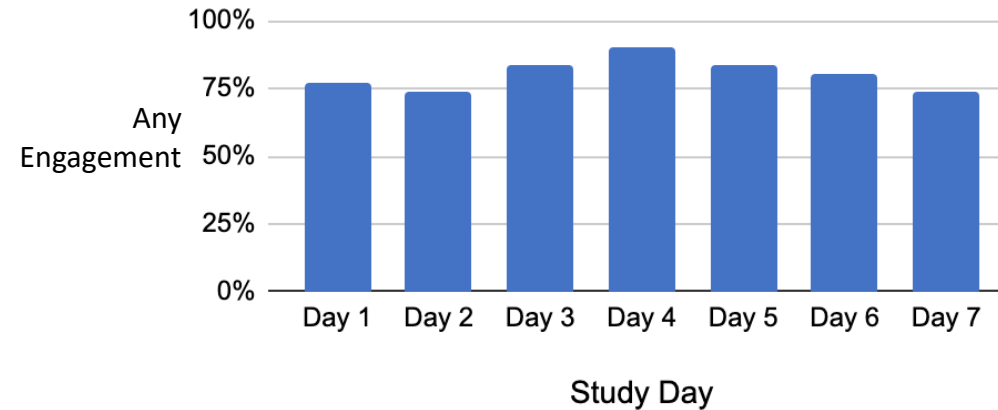
### Writing

79% replied at least once/day

### Modular

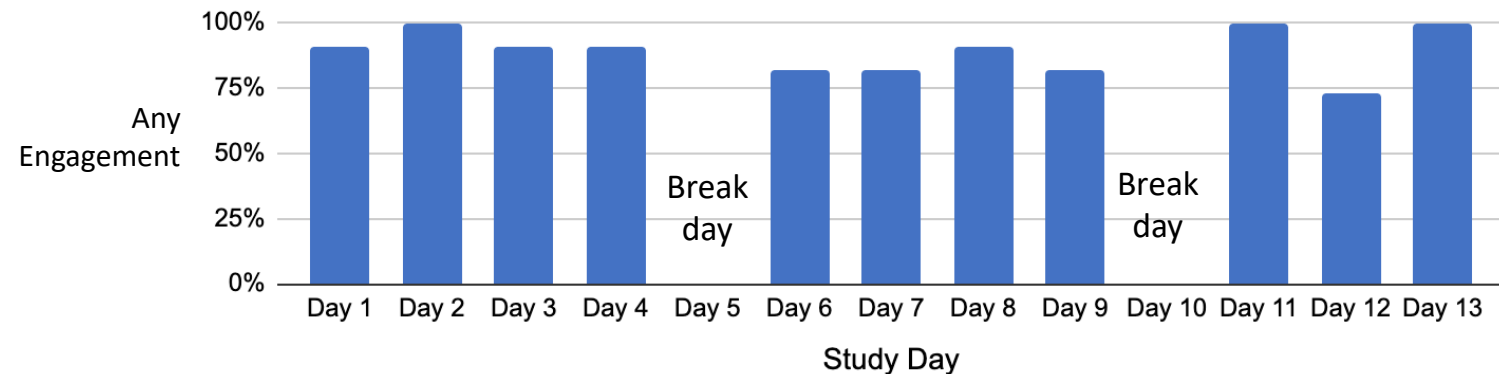
83% replied at least once/day

## 1 Week Program (n=31)



**All users interviewed (n=21) were interested in continuing to use the system, if available for a longer timeframe**

## 2 Week Program (n=11)



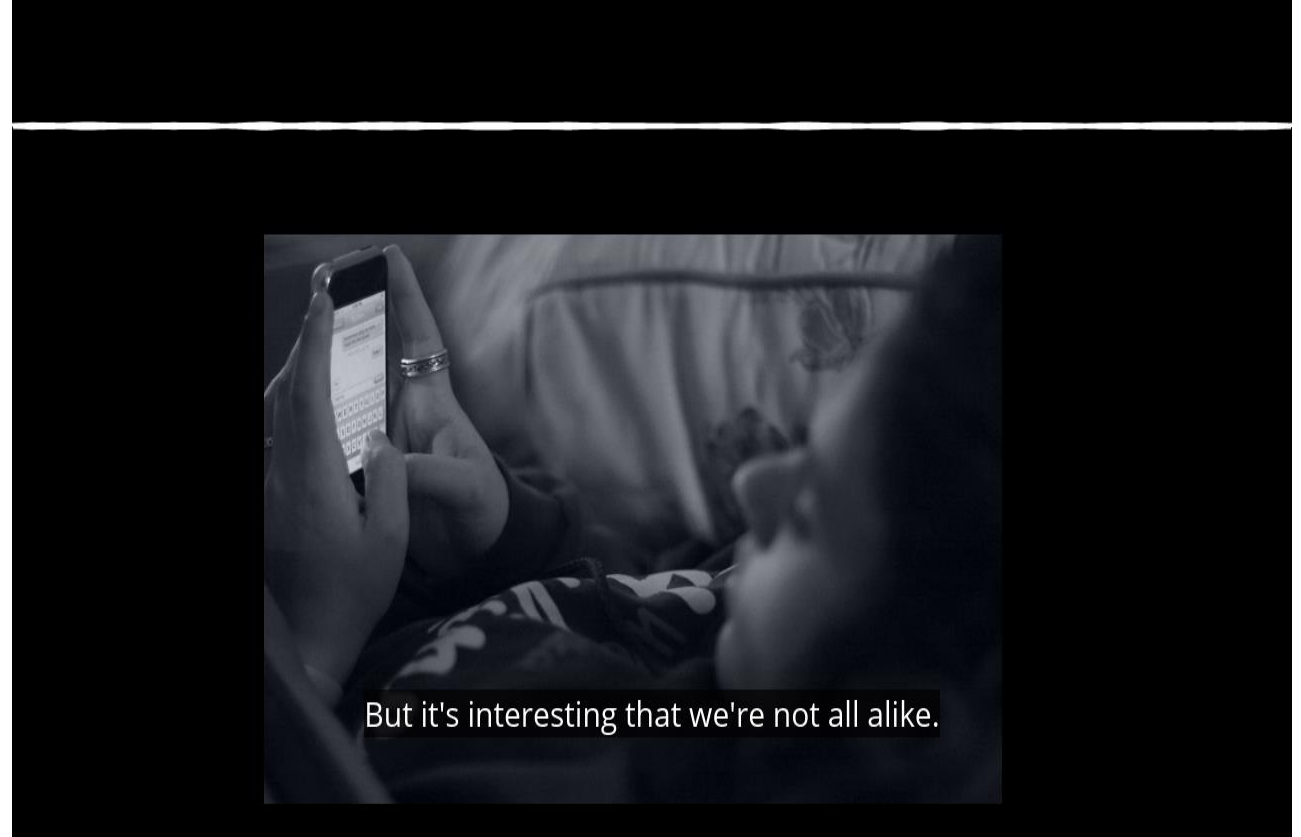
# Goal is to fully deploy this service within 12 months

- **Expand content.** Extend the content bank to 8 weeks, and diversify to meet many users' needs.
- **Build to scale.** Create a robust technical infrastructure.
- **Personalization.** Enroll and test with a minimum of 5,000 users to develop robust reinforcement learning algorithms.



# Goal is to fully deploy this service within 12 months

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# Contact Us



-  Mental Health America  
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Suite 820  
Alexandria, VA 22314
-  [Facebook.com/mentalhealthamerica](https://www.facebook.com/mentalhealthamerica)
-  [Twitter.com/mentalhealtham](https://twitter.com/mentalhealtham)
-  [Instagram.com/mentalhealthamerica](https://www.instagram.com/mentalhealthamerica)
-  [Youtube.com/mentalhealthamerica](https://www.youtube.com/mentalhealthamerica)
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