THE UNIVERSITY of NORTH CAROLINA at CHAPEL HILL

INFORMS ANNUAL MEETING

Can AI-Generated Stories Heal the Hearts?

Jiayi Xu, Master Student

Department of Statistics and Operation Research, UNC-Chapel Hill

10/27/2025

We Cannot Live Without Stories

- *"The universe is made of **stories**, not atoms."*

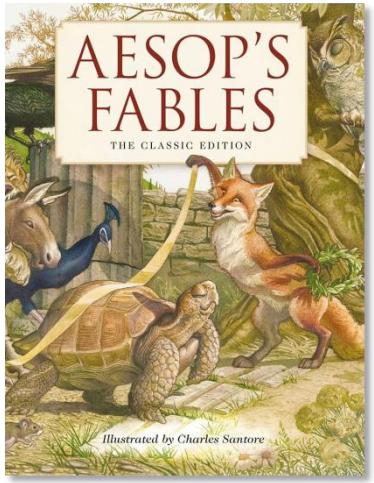
  — Muriel Rukeyser

- *"We live by **stories** we tell about ourselves."*

  — Dan P. McAdams

- *"Maybe **stories** are just data with a soul."*

  — Brene Brown



Storybooks

Movies

Diaies

1 Introduction

The Power of Stories in Mental Health

Why are we moved by Stories? - Narrative Transportation

- Narrative Transportation refers to the experience of being mentally and emotionally immersed into a story world. (Green & Brock 2000; 2002)

How stories influence us?

- Stories can effectively evoke emotions.
  - be used to promote positive emotions and alleviate negative ones.
- Stories can shape congnition.
  - self-reflection
  - meaning construction
- Stories can create change for attitudes, intentions, and behaviors over time.

(Parker & Wampler 2006; Green et al. 2012; Bhattacharjee et al. 2022)

AI-Generated Stories

Limitations of traditional stories:

- The stories humans write are finite.
- We can't always find a story that fits our own situation.
- Traditional therapeutic stories are not easily available on demand.

AI-generated Stories:

- AI can generate lifelike stories that are often indistinguishable from human-written ones.
- People can immerse themselves in AI-generated stories and empathize with their characters.

(Clark et al. 2021; Hitsuwari & Nomura 2022; Dou et al. 2022; Shen et al. 2024)

1 Introduction

Emotional Support Conversation

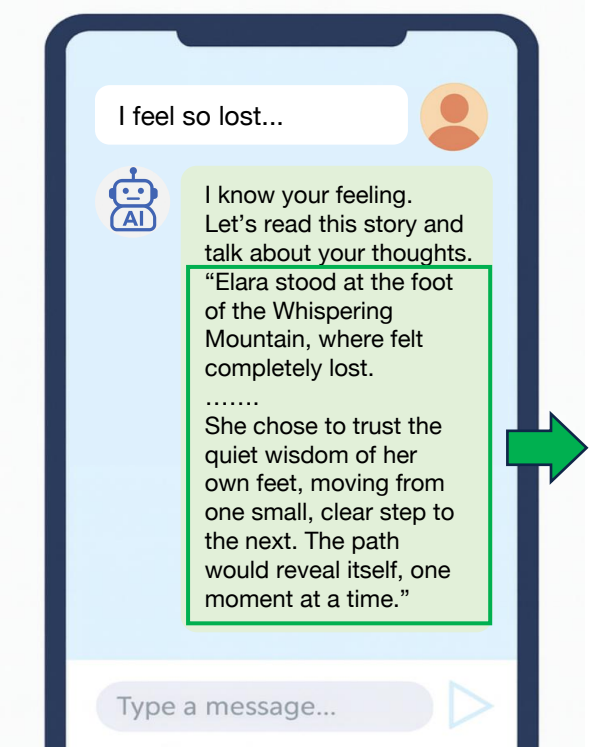
- **Emotional support conversation (ESC)** aims to alleviate individuals' emotional distress and provide guidance for navigating personal challenges through engaging dialogue.
- Large Language Models (LLMs) have been widely used in ESC, for example:
  - Emotion recognition (Sorin et al. 2024)
  - Empathetic response (Qian et al. 2023; Lee et al. 2024)
  - Strategy selection and strategy-constrained response generation (Shen et al. 2025)

- We envision **AI-generated stories** as a new form of providing emotional support:
  - Integrates emotion and cognition into a unified narrative experience.
  - Enables the real-time creation of personalized stories that human cannot easily produce.
  - Stories move people differently — through narrative transportation.

2 Research Questions

A Story-based Chatbot for Emotional Support

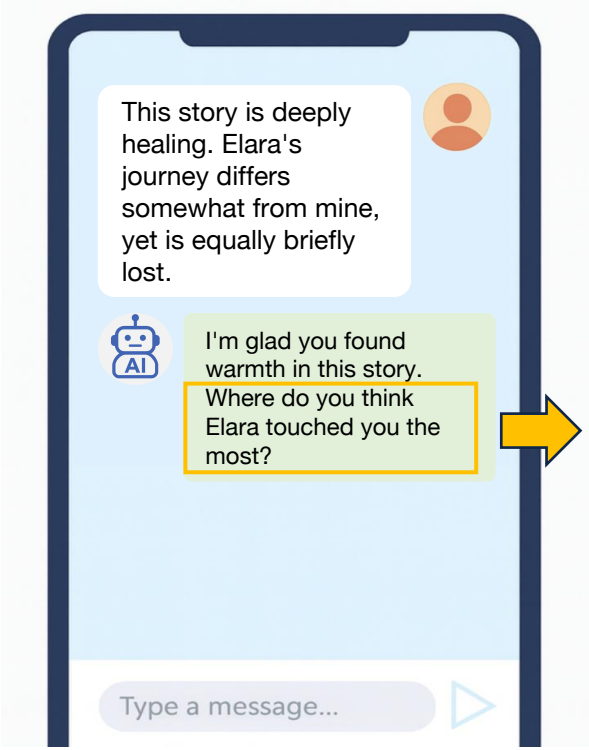
- We design a new AI Chatbot, built on story-based interaction.



~~Directly provide solutions~~

A resonant story

(A protagonist shares similar experiences with the user)



Follow-up conversaton

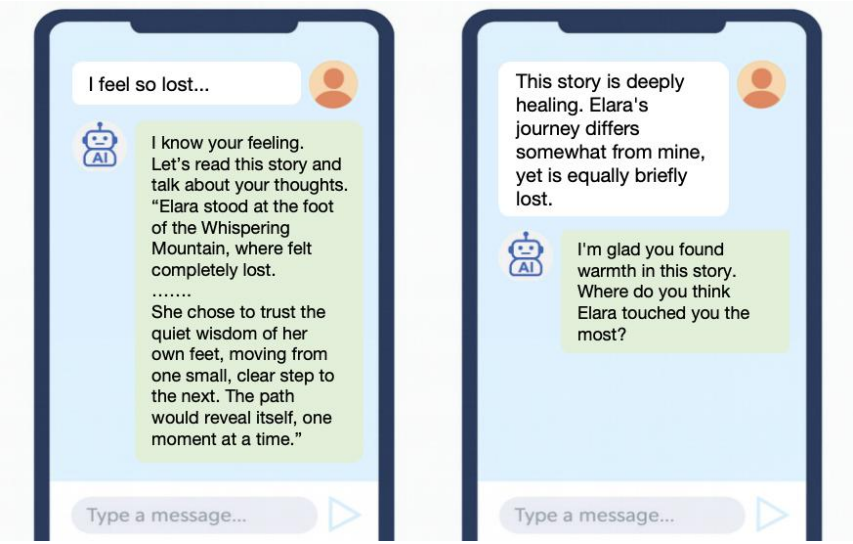
(Inspire users to think independently based on the story)

2 Research Questions

A Story-based Chatbot for Emotional Support

Research Questions:

1. If we take conventional conversational AIs (e.g., GPT-4o, deepseek) as the baseline, how does our story-based chatbot perform in comparison?



ChatGPT

deepseek

2 Research Questions

A Story-based Chatbot for Emotional Support

Research Questions:

1. If we take conventional conversational AIs (e.g., GPT-4o, deepseek) as the baseline, how does our story-based chatbot perform in comparison?

2. The mechanisms behind the story-based chatbot.

3. How different characteristics of stories influence their effectiveness?

We will explore these in the future research.

3 Experiment Design

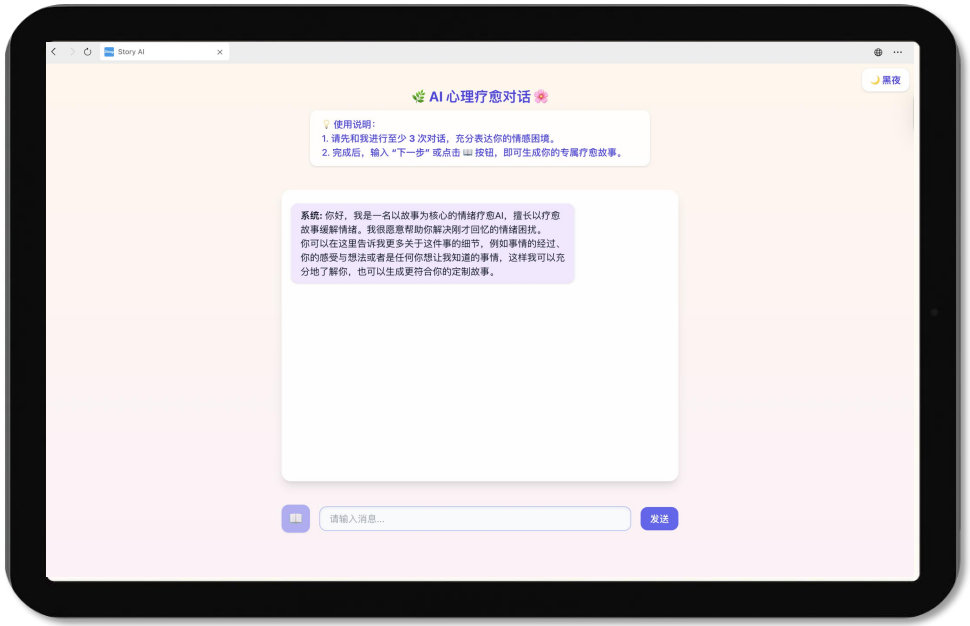
System Setup and Overview

We developed two real systems for study:

1. Story-based Chatbot
2. Baseline Chatbot

Details:

- Implemented with DeepSeek v3.1 API for experimental controllability and Chinese user compatibility.
- Ensured identical interface and user interactions across both systems.



Example page of the story-based chatbot

3 Experiment Design

Pre-experiment: Participants & Procedure

Study Design

- 2 (Emotion: Anger, Fear) × 2 (Chatbot Type: Story-based vs. Baseline) between-subject design.
- 40 participants were randomly assigned to one of the four conditions.
- Recall → Interaction: each participant was asked to recall and describe a recent emotion-evoking situation and then interacted with one of the two AI chatbots.

Measurement

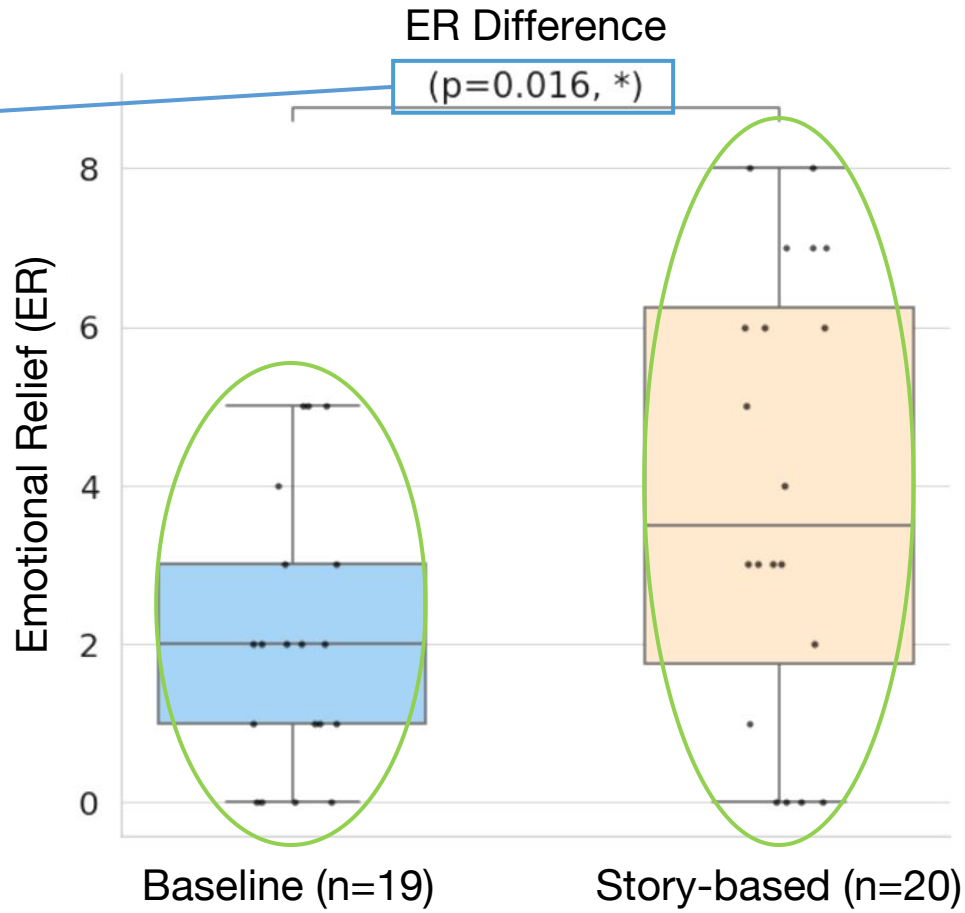
Emotional Relief	Change in general emotional state (Post – Pre) [-5, +5]
Emotional Intensity	Self-reported intensity of six discrete emotions (Happiness, Sadness, Fear, Anger, Disgust, Surprise). [0-100]
Transportability	Tendency to become immersed in stories. (Individual trait) [1,7]
Demographic Information	Gender, age, education level, and AI-use frequency.

4 Results

4.1 Emotional Relief

Story-based > Baseline

Participants in the Story-based group reported significantly higher levels of emotional relief than those in the Baseline condition (p = .016*).

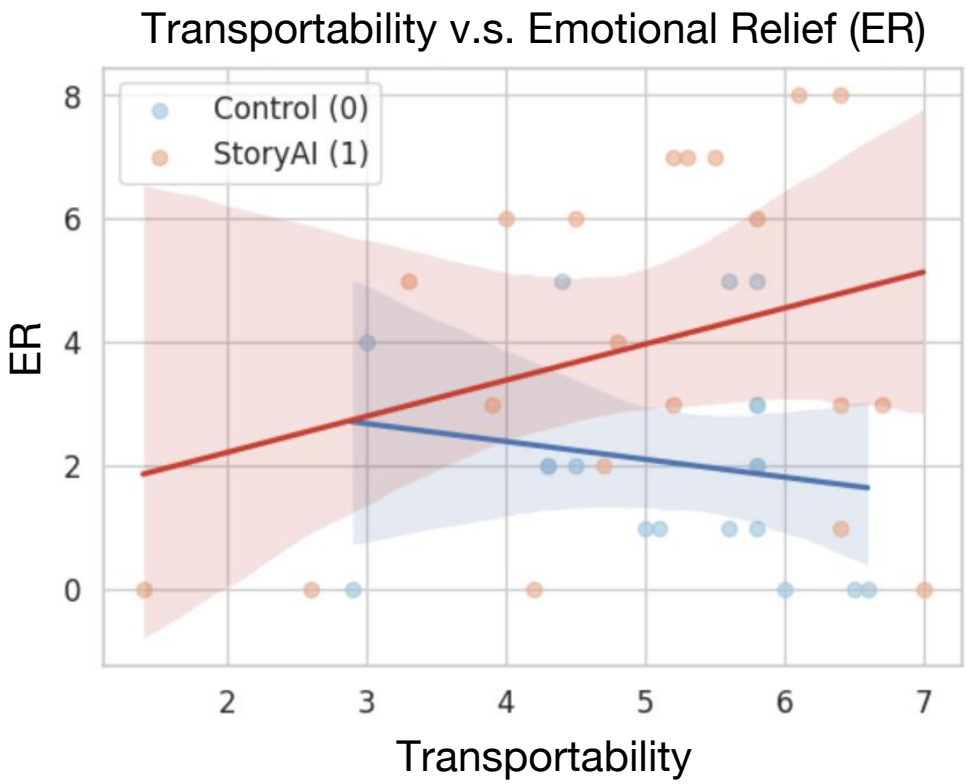


The story-based group shows greater **variability** in emotional relief scores.

Story-based Chatbot may have stronger effects for certain participants.

4 Results

4.2 Transportability



Group	N	Mean(Std)	Welch's t-test
Story-based	20	3.950 (2.837)	t = -2.542 p = 0.016 *
Baseline	19	2.053 (1.715)	
⇩ After filtering top 75% transportability			
Story-based	15	4.333 (2.845)	t = -2.886 p = 0.008 **
Baseline	14	1.857 (1.657)	

The more participants could "enter" the story world, the stronger their emotional relief from Story-based Chatbot became.

Story immersion amplifies the healing effect.

THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL