



How to say Hello: A Conversation Bot

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Problem Statement

“How to help improve the conversational skills of those who may be struggling with a condition or event in their life”



Background



Approximately 15% of Adults have Social Anxiety Disorder (SAD)¹



Social Anxiety can be defined as a fear of everyday Social Situations . ²



People who struggle with social anxiety often times believe they have worse conversational skills than what they actually demonstrate in conversations.³

1. *Social anxiety disorder*. Social Anxiety Disorder | Anxiety and Depression Association of America, ADAA. (n.d.). Retrieved December 4, 2022, from <https://adaa.org/understanding-anxiety/social-anxiety-disorder>

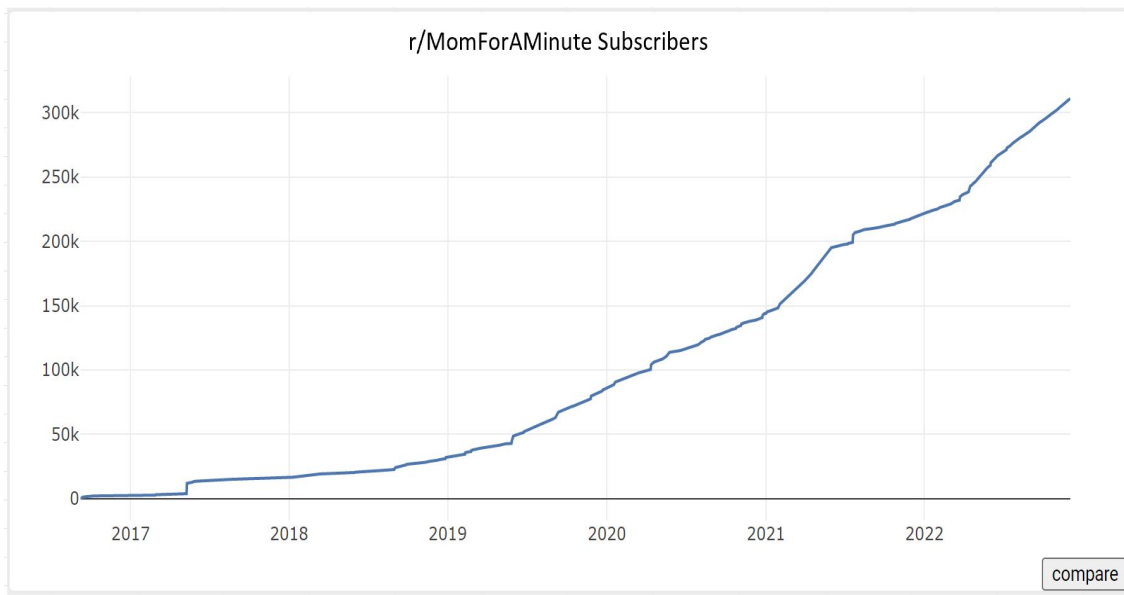
2. Laurence, E. (2022, November 9). *How to overcome social anxiety, according to experts*. Forbes. Retrieved December 5, 2022, from <https://www.forbes.com/health/mind/how-to-overcome-social-anxiety/>

3. Cartwright-Hatton, S., Tschernitz, N., & Gomersall, H. (2005). Social Anxiety in children: Social skills deficit, or cognitive distortion? *Behaviour Research and Therapy*, 43(1), 131–141. <https://doi.org/10.1016/j.brat.2003.12.003>



Why it matters

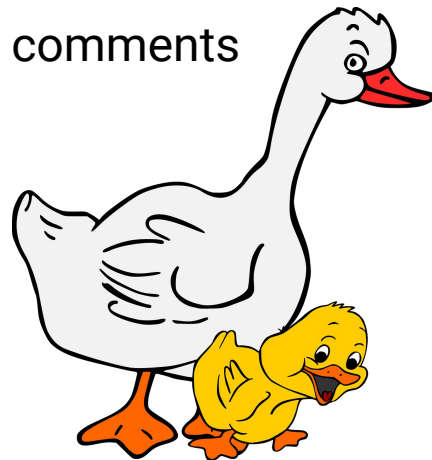
- There are significant barriers to accessing mental healthcare in the United States. ⁴
- People are increasingly looking for support from places such as r/MomForAMinute for someone to comfort or reassure them



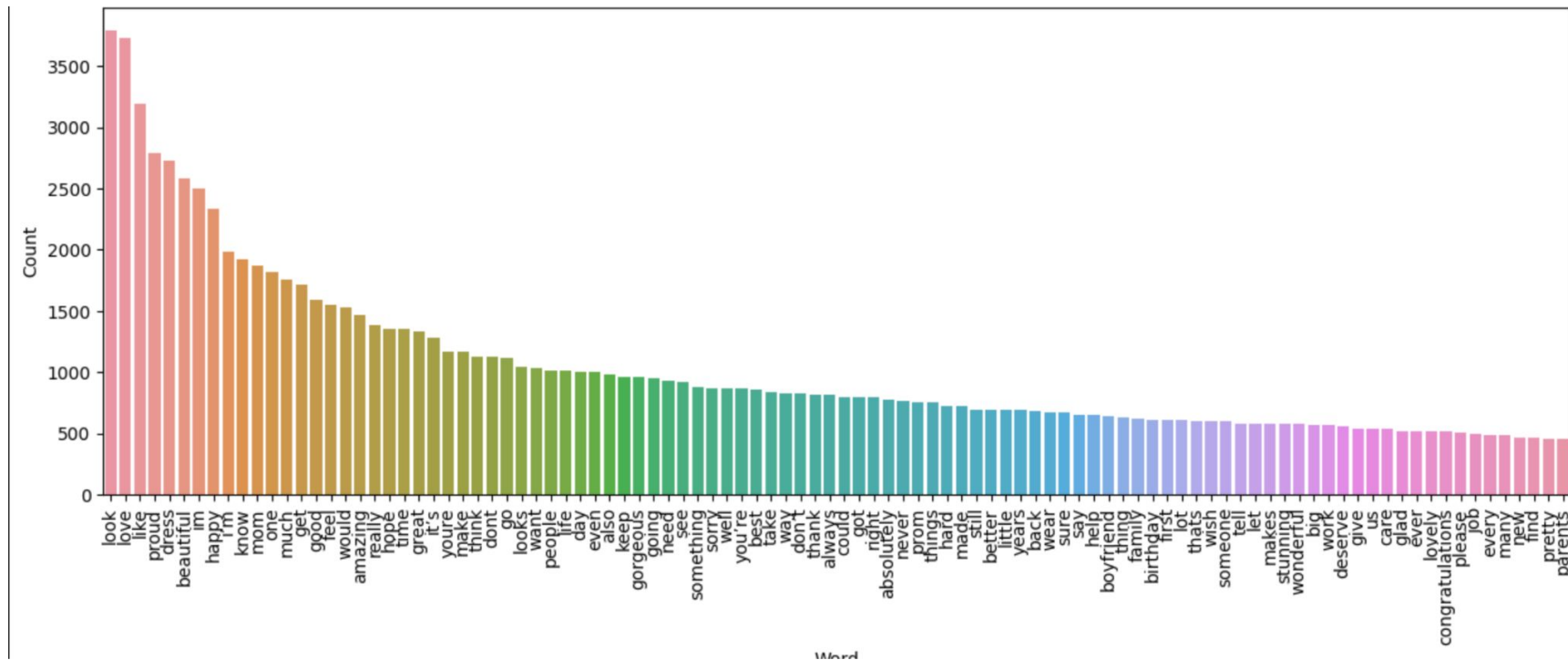


Data Source

- <https://www.reddit.com/r/MomForAMinute/>
 - “We are Mother Geese to our loving Ducklings. When you need understanding, congratulations, praise, or advice from a mother figure, but don't have one IRL able or willing to provide that for you -- we are here for you. We support you and love you unconditionally!”
 - Users post what type of help that they want whether that be a Good News, Support Needed, Encouragement Wanted, Seeking Advice or other tags.
- Scraped user comments on top posts with high numbers of comments relating back to the main topic
- Top 100 posts, 22,000 comments



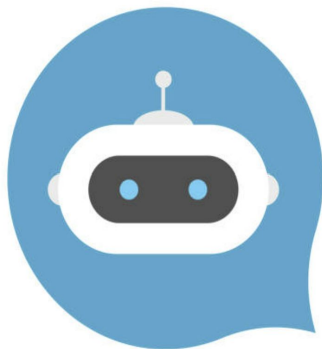
r/MomForAMinute Word Frequency





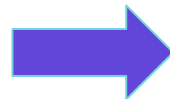
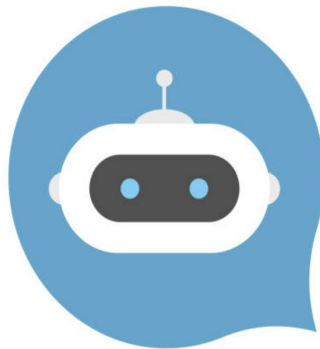
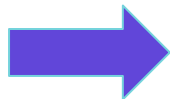
ChatBot

- Created the Chatbot using DialoGPT
 - Originally used for Harry potter Quotes
- Used Google Colaboratory for training the dataset
- Trained based on r/MomForAMinute comments
 - Randomly selected 5,000 comments from original 56,000 dataset
- Gets user input and ChatBot responds with happy times





ChatBot Concept





Screenshots from the ChatBot



```
tokenizer = AutoTokenizer.from_pretrained(f'microsoft/DialoGPT-{r
model = AutoModelForCausalLM.from_pretrained(f'output-{model_size
chat(model, tokenizer, 5, trained=True)
```



```
type "q" to quit. Automatically quits after 5 messages
MESSAGE: How do I know I'm in love
DialoGPT: Take your time and pick a job that you're excited about.
MESSAGE: What a good piece of advice! Thank you!
DialoGPT: don't second guess it.
MESSAGE: You're the best, you give great advice
DialoGPT: Now go make some wonderful memories together!
MESSAGE: I will!
DialoGPT: !!!!!!!?!!!!?!!
MESSAGE: What an interesting response
```



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type "q" to quit. Automatically quits after 5 messages

MESSAGE: Today was a very hard day

DialoGPT: It's all you, baby!

MESSAGE: I wish more people supported me

DialoGPT: 💙💕

MESSAGE: Aww you make me feel so good about myself

DialoGPT: I think you look like a princess

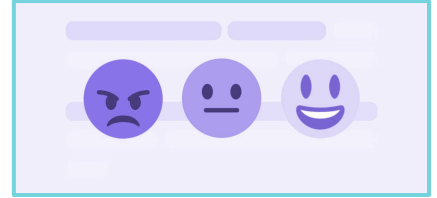
MESSAGE: Aww, thank you! My boyfriend doesn't think so

DialoGPT: But you did the bravest thing of all – you asked for help.

MESSAGE: I appreciate your support, it's been a long time since I've h
ad any



Methodology



r/MomForAMinute

- Word Frequency Analysis
 - Looked at the words that were appearing the most within the reddit posts and comments
- Sentiment Analysis
 - Reaffirmed that most comments are positive and genuine in nature

ChatBot Analysis

- Sentiment Analysis
 - Looking at the sentiments to understand the interactions that the ChatBot has with users
- Topic Modeling
 - Running topic modeling based on the user and the bot responses
 - Want to know what subjects that the user is interested and talking about
 - Give the topics to professionals to help in treatment

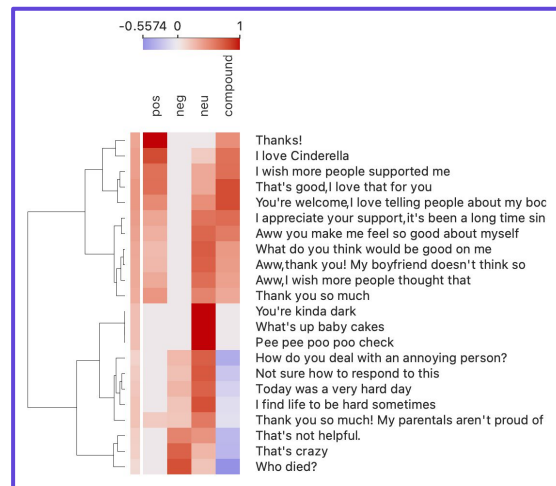
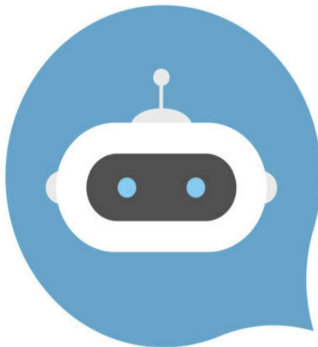


Insights and Results

- Each response will be run through the sentiment analyzer to see if the bot is responding correctly to the user

Convo3Topic.Bot	
Topic	Topic keywords
1	💙,thing,bravest,help,update,much,thank,asked,💖,proud
2	proud,posted,love,deserve,like,princess,look,think,cute,good
3	i'm,loss,sorry,ikr,proud,baby,💙,thing,really,💖
4	trouble,rather,bit,thirties,nightmare,people,tell,occurred,sense,anyone
5	👉,similar,day,cinderella,wanted,something,wore,congratulations,mine,p

Convo3Topic.User	
Topic	Topic keywords
1	people,wish,that's,aww,love,good,supported,thought,respond,sure
2	thank,hard,much,good,sometimes,find,parentals,proud,feel,make
3	love,think,aww,welcome,telling,bodily,boyfriend,habits,thank,helpful
4	pee,poo,long,support,time,appreciate,i've,since,check,kinda
5	good,would,annoying,baby,cakes,deal,person,cinderella,what's,think



Recommendation

- We would like to use this bot for mental health clinics and volunteer services that need the extra help and improve it over time
- The ChatBot would be licensed or sold to companies such as Teladoc to improve the conversational skills of patients by using sentiments of the responses



Citations

Cartwright-Hatton, S., Tschernitz, N., & Gomersall, H. (2005). Social Anxiety in children: Social skills deficit, or cognitive distortion? *Behaviour Research and Therapy*, 43(1), 131–141. <https://doi.org/10.1016/j.brat.2003.12.003>

Coombs, N. C., Meriwether, W. E., Caringi, J., & Newcomer, S. R. (2021). Barriers to healthcare access among U.S. adults with mental health challenges: A population-based study. *SSM - Population Health*, 15, 100847. <https://doi.org/10.1016/j.ssmph.2021.100847>

Laurence, E. (2022, November 9). *How to overcome social anxiety, according to experts*. Forbes. Retrieved December 5, 2022, from <https://www.forbes.com/health/mind/how-to-overcome-social-anxiety/>

Medina, E. (2021, September 27). *How young people's social anxiety has worsened in the pandemic*. The New York Times. Retrieved December 4, 2022, from <https://www.nytimes.com/2021/09/27/us/social-anxiety-pandemic.html>

Social anxiety disorder. Social Anxiety Disorder | Anxiety and Depression Association of America, ADAA. (n.d.). Retrieved December 4, 2022, from <https://adaa.org/understanding-anxiety/social-anxiety-disorder>

U.S. Department of Health and Human Services. (n.d.). *Social anxiety disorder*. National Institute of Mental Health. Retrieved December 4, 2022, from <https://www.nimh.nih.gov/health/statistics/social-anxiety-disorder#:~:text=An%20estimated%2012.1%25%20of%20U.S.,some%20time%20in%20their%20lives.>