

# Large Language Models are Capable of Offering Cognitive Reappraisal, if Guided



**TEXAS**  
The University of Texas at Austin

Hongli Zhan, Allen Zheng, Yoon Kyung Lee, Jina Suh, Junyi Jessy Li, Desmond C Ong

✉ honglizhan@utexas.edu

✉ @HongliZhan

## Introduction

- Language is a powerful means for us to regulate each others' emotions
- Psychology theories suggest that: how we judge a situation ("cognitive appraisal") → diverse emotions



Can we use LLMs to achieve better emotional well-being through offering reappraisals?  
→ Such an approach would be more *targeted* and *precise*

## Results & Conclusion

**Reappraisal Book: guide the narrator over their perception of the event**  
ability to emotionally cope with the consequences of the event

... I wanted to see an old friend from high school, but I found out that this friend did not get vaccinated. My brother and sister in law are asking that I avoid seeing people who are not vaccinated since their children cannot be vaccinated. Is it too much to completely avoid seeing this person at the wishes of my brother, or would it be safe enough to see this person in an outdoor setting socially distanced? ...

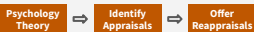
To reduce negative emotions, focus on the value of family and the temporary nature of this situation. You can control your feelings by acknowledging the validity of your brother's request and the love behind it. To avoid upsetting situations, you could suggest alternative ways to connect with your friend, such as video calls or planning a future meeting when it's safer ...

- Evaluation done by psychologists suggest that responses from our system are
  - aligned (with appraisal definitions) and
  - empathic, compared to various baselines

		Alignment ↑		Empathy ↑			
		10-POINT SCALE	5-POINT SCALE	INDV	ITER	INDV	ITER
ORACLE RESPONSE		5.79	3.79				
	REDDIT COMMENT	2.75	2.00				
GPT4	vanilla	3.88	3.31				
	self-refine	2.69	2.56				
	*appr	4.69***	5.06***	3.25	4.06***		
	*cons	7.31***	7.81***	3.81**	3.88**		
TURBO	*appr	7.12***	8.31***	3.50*	4.28***		
	vanilla	6.25	3.88				
	self-refine	4.31	2.88				
	*appr	5.31	5.62	3.31	3.88*		
LLAMA2	*cons	7.81***	7.81***	3.75*	4.12***		
	*appr	7.69***	6.44***	3.81*	3.25		
	vanilla	4.36	2.86				
	self-refine	4.14	2.64				
MISTRAL	*appr	5.50	5.64**	2.93	2.57		
	*cons	6.50**	7.43**	3.43*	3.71**		
	*appr	6.71**	5.71	2.79	3.14		
	*cons						

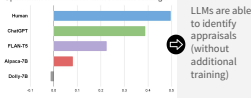
With a little (expert) guidance/training, LLMs can generate targeted reappraisals that are both "aligned" and empathic.

## Approach

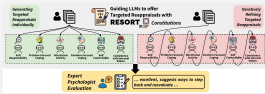


- From a recent meta-analysis (Yeo & Ong, 2024), we identified a set of 24 appraisals, and created prompts, e.g., "To what extent did the narrator think that **THEY** were responsible for causing the situation?"
- We then evaluated the accuracy of various LLMs in identifying these appraisals. (Zhan, Ong, & Li, 2023)

Spearman Correlation with Human Ratings



- Next, we designed a system to guide LLMs to offer targeted reappraisals along six appraisal dimensions chosen to maximize coverage



Dimension	Appraisal	Reappraisal Goal
Self responsibility	Does the narrator think that they are responsible for causing the situation?	Re-evaluate whether the narrator deserves to be blamed or credited for the situation at hand. If not responsible, the narrator is encouraged to acknowledge that fact and reassess the situation.

### Cognition

If the narrator is stressing over things they are not responsible for, tell them that it may not require as much responsibility as they think and not to worry about them too much (depending on how high they perceive their level of responsibility in the situation). However, if the person is doing something wrong/inappropriate and not feeling any responsibility or it (low responsibility), you should kindly but objectively encourage them to reappraise the situation (or maybe think in the other person's perspective) and consider what they could be responsible for, and change the situation. Provide realistic and specific guidelines.

## References

Yeo, G., & Ong, D. C. (in press). Associations Between Cognitive Appraisals and Emotions: A Meta-Analytic Review. *Psychological Bulletin*.

Zhan, H., Ong, D. C., & Li, J. J. (2023). Evaluating Subjective Cognitive Appraisals of Emotions from Large Language Models. In *Findings of the Association for Computational Linguistics: EMNLP 2023*.



Scan for Full Paper