Empathetic Response Generation for Distress Support

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affects 29% of people in their lifetime





"About 1 billion people globally are affected by mental disorders; a scalable solution such as an Al therapist could be a huge boon."

- Mary Czerwinski (Microsoft, 2021)

EPFL Existing Work



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 Deep neural networks work very effectively in the development of open-domain conversational agents or chatbots (Sutskever et al., 2014; Vinyals and Le, 2015; Wen et al., 2015)

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 - **Counseling conversation datasets** (E.g. Althoff et al., 2016; Zhang and Danescu-Niculescu-Mizil, 2020)
 - Not publicly accessible due to privacy and ethical reasons
 - Publicly available emotional dialogue datasets: EmotionLines (Hsu et al., 2018); EmoContext (Chatterjee et al., 2019); EmpatheticDialogues (Rashkin et al., 2018); ES-Conv (Liu et al., 2021)
 - Include only a limited amount of dialogues dealing with distress

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- Benchmarking and Comparison

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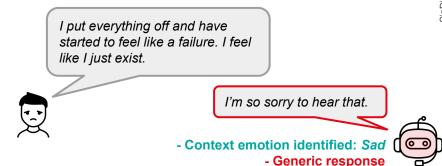
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I put everything off and have started to feel like a failure. I feel like I just exist. I'm so sorry to hear that. • Context emotion identified: Sad • Generic response Do you want to talk about it? • Context emotion identified: Sad

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You're not alone. I understand how you feel. I'm here if you want to talk. What's on your mind right now?



- Context emotion identified: Sad - Response conditioned on empathetic intent: Agreeing

- Response conditioned on empathetic intent: Questioning

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- Generic response

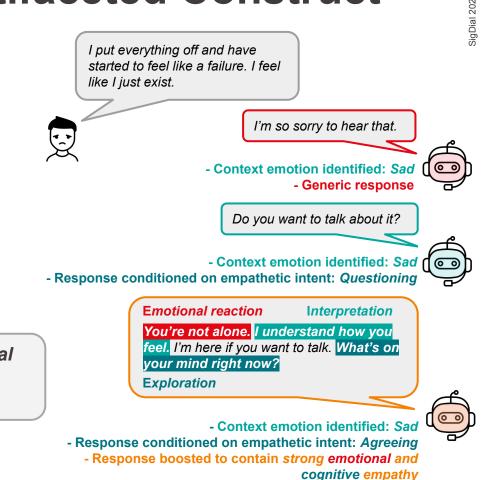
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Do you want to talk about it?



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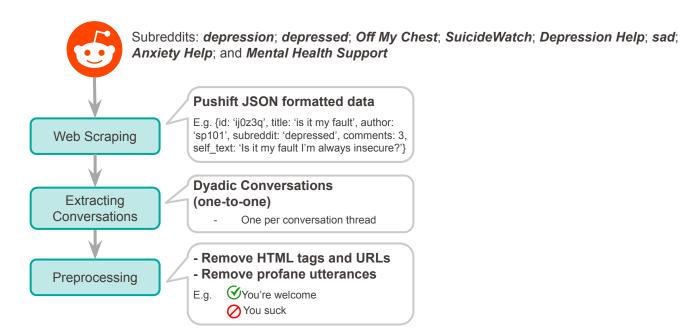




Subreddits: *depression*; *depressed*; *Off My Chest*; *SuicideWatch*; *Depression Help*; *sad*; *Anxiety Help*; and *Mental Health Support*

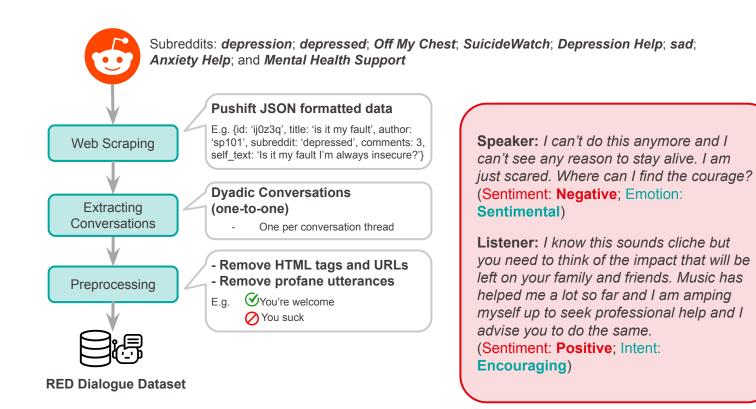






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EPFL Statistics of the RED Dataset

Subreddit	# Dialogues	# Turns	# Tokens	Avg. # turns per dialog	Avg. # tokens per dialogue	Avg. # tokens per turn
r/depression	510,035	1,396,044	106,967,833	2.74	209.73	76.62
r/depressed	10,892	23,804	1,940,000	2.19	178.11	81.50
r/offmychest	437,737	1,064,467	109,459,738	2.43	250.06	102.83
r/sad	18,827	42,293	3,088,562	2.25	164.05	73.03
r/SuicideWatch	262,469	791,737	59,267,000	3.02	225.81	74.86
r/depression_help	23,678	51,849	5,412,390	2.19	228.58	104.39
r/Anxietyhelp	8,297	18,351	1,428,287	2.21	172.14	77.83
r/MentalHealth Support	3,551	7,931	772,952	2.23	217.67	97.46
All	1,275,486	3,396,476	88,336,762	2.66	226.06	84.89

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EPFL Topic Coverage

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Murtagh, F. and Legendre, P. (2014). Ward's hierarchical agglomerative clustering method: which algorithms implement ward's criterion? Journal of classification.

EPFL Topic Coverage

- Clustering: Agglomerative clustering
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4,363 clearly identifiable topic clusters

Topics	Keywords Extracted
Suicidal Ideation	commit, killing, death, painless, option
Anxiety Attacks	anxiety, anxious, attacks, social, attack
Weight Gain	eating, weight, eat, lose, fat
Loneliness	lonely, surround, connect, isolated, social
Failing College	study, college, class, semester, failing
Alchoholic	drinking, drink, alcohol, drunk, sober
US Election	trump, president, donald, election, war
Covid-19	covid, 19, pandemic, shambolic, brought

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 - Identify 32 emotions, Neutral and 8 empathetic response intents: Agreeing, Acknowledging, Encouraging, Consoling, Sympathizing, Suggesting, Questioning, and Wishing
 - Classifier accuracy on RED: 64%

EPFL Frequent emotion-intent flow patterns

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11Ashamed 2/Questioning 3/Suggesting 3/Suggesting 11Devastated 3/Terrified 3/Apprehensive 11Sad 2/Wishing 3/Apprehensive 11Disappointed 2/Wishing 3/Anxious 4/Wishing 11Disappointed 2/Afraid 3/Apprehensive 3/Apprehensive 11Lonely 2/Embarrassed 3/Boy and antipart an	1 Embarrassed	2lSuggesting		4lSympathizing
1/Ashamed 2/Questioning 3/Questioning 1/Devastated 3/Terrified 4/Questioning 1/Sad 2/Wishing 3/Afraid 3/Afraid 1/Disappointed 2/IAfraid 3/Aprehensive 4/Wishing 1/Disappointed 2/Afraid 3/Aprehensive 4/Wishing 1/Lonely 2/Embarassed 3/Ashamed 4/Ashamed 1/Sentimental 2/Devastated 3/Sad 4/Boharned 1/Nostalgic 2/Disappointed 3/Lonely 4/Disappointed 1/Sentimental 2/Devastated 3/Lonely 4/Lonely 1/Disappointed 2/Lonely 3/Sentimental 4/Lonely 1/Disappointed 2/Lonely 3/Lonely 4/Lonely 1/Disappointed 2/Lonely 3/Lonely 4/Lonely 1/Disappointed 2/Lonely 3/Lonely 4/Lonely 1/Disappointed 2/Lonely 3/Lonely 4/Lonely 1/Disappointed 2/Lonely 3/Dispusted 4/Lonely 1/Disappointed 2/Lonely 3/Dispusted 4/Lonely 1/Dispusted 2/Dolityusted 3/Dispusted 4/L	Sall Al of			
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IlLonely 2lApprehensive 3lDevastated 4lApprehensive IlLonely 2lAshamed 3lSad 4lApprehensive IlSentimental 2lDevastated 3lDisappointed 4lDevastated IlNostalgic 2lDisappointed 3lLonely 4lDavastated IlDisgusted 2lDisappointed 3lSentimental 4lSad IlFurious 2lSentimental 3lSentimental 4lLonely IlFurious 2lNostalgic 3lSentimental 4lLonely IlAnoryed 2lDisgusted 3lDisgusted 4lFurious Ilealous 3lDisgusted 4lApprehensive 4lConely Ilealous 3lSentimental 4lLonely 4lLonely 2lostalgic 3lDisgusted 4lLonely 4lLonely Ilealous 3lDisgusted 3lDisgusted 4lApprehensive Ilealous 3lDisgusted 3lDisgusted 4lLonely	11Disappointed	2 Afraid		
11Lonely 2)Einbarrassed 31Devastated 41,4)Einbarrassed 2)Ashamed 3)Sad 41,4)Einbarrassed 2)Devastated 3)Sad 41,4)Einbarrassed 1)Sentimental 2)Devastated 3)Disappointed 41,4)Einbarrassed 1)Sostalgic 3)Disappointed 31,0)Eisappointed 41,0)Eisappointed 1)Guilty 2)Lisappointed 31,0)Eisappointed 41,0)Eisappointed 1)Disgusted 2)Lisappointed 31,0)Eisappointed 41,0)Eisappointed 11/Linrious 2)Sentimental 31,0)Eisappointed 41,0)Eisappointed 11/Linrious 2)Disgusted 31,0)Eisappointed 41,0)Eisappointed 11/Linrious 2)Disgusted 31,0)Eisappointed 41,0)Eisappointed 11/Linrious 2)Disgusted 31,0)Eisappointed 41,0)Eisappointed 11/Linrious 31,0)Eisappointed 31,0)Eisappointed 41,0)Eisappointed 11/Linrious 31,0)Eisappointed <td< td=""><td>The support</td><td>2 Apprehensive</td><td></td><td></td></td<>	The support	2 Apprehensive		
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1lSentimental 1lNostalgic IlGuitty2lDevastated 2lSad3lDisappointed4lDevastated 4lSad 2lDisappointed1lNostalgic IlGuitty2lDisappointed 2lLonely3lLonely4lDisappointed 4lLonely1lDisgusted IlFurious IlAnnoyed2lNostalgic 2lGuitty 2lFurious3lSentimental 3lNostalgic4lSentimental 4lLonely1lAnnoyed 2lAnnoyed 2lAnnoyed2lFurious 2lAnnoyed 2lJealous3lAnnoyed 3lJealous4lAnnoyed 4llealous	TiLonely	2lAshamed	3lSad	
1/Sentimental 2/Sad 3/D/Sappointed 4/Bodd 1/Nostalgic 2/D/Sappointed 3/Lonely 4/D/Sappointed 1/Guilty 2/Lonely 3/Sentimental 4/Lonely 1/Disgusted 2/Sentimental 3/Nostalgic 4/Lonely 1/Norstalgic 2/Sentimental 3/Nostalgic 4/Sentimental 1/Norsy 2/Guilty 3/Guilty 4/Guilty 1/Annoyed 2/Disgusted 3/Disgusted 4/Angry 1/Jealous 2/Furious 3/Angry 4/Annoyed 2/Annoyed 3/Annoyed 3/Angry 4/Jealous		2 Devastated	21Disconsisted	
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1/Guity 2/Lonely 3/Sentimental 4/Lonely 1/Disgusted 2/Sentimental 3/Nostalgic 4/Sentimental 1/IFurious 2/Nostalgic 3/Nostalgic 4/Sentimental 1/Annoyed 2/Disgusted 3/Disgusted 4/Lonely 1/Lanoyed 2/Disgusted 3/Disgusted 4/Lonely 1/Lanoyed 2/Disgusted 3/Disgusted 4/Lanoyed 1/Lealous 2/Langry 3/Lanoyed 3/Lanoyed 2/Lanoyed 3/Lanoyed 3/Lanoyed 3/Lanoyed 2/Lalous 3/Lalous 3/Lalous 4/Lalous	1lNostalgic	2 Disappointed	3IL onely	
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11Annoyed 21Disgusted 31Disgusted 41Angry 11Jealous 21Furious 31Furious 41Annoyed 21Annoyed 21Annoyed 31Annoyed 41Jealous 21Jealous 21Jealous 31Jealous 41Jealous	1 Angry			
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2lAngry 3lAngry 4lAnnoyed 2lAnnoyed 3lAnnoyed 3lAnnoyed 2lJealous 3lJealous 3lJealous				
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2lJealous 3lJealous				4iJealous
Zictatous	0			
turn 1 (Sp) Turn 2 (Ls) Turn 3 (Sp) Turn 4 (LS)				
	lurn I (Sp)	Turn 2 (Ls)	Turn 3 (Sp)	Turn 4 (LS)

EPFL **Frequent emotion-intent flow patterns**

speaker	Listener	speaker	Listener
	2lPrepared	3lPrepared	
	2lHopeful	3lAnticipating	41D 1
	2lProud	3lHopeful	4lPrepared
1 Prepared	2lJoyful	3lProud	4 Anticipating
1 Anticipating	2lContent	3IExcited	4lHopeful 4lProud
1 Hopeful	2lCaring	3lContent	
1lProud	2lGrateful	3lCaring	4lContent
1lJoyful	2lTrusting	3lGrateful	4lCaring
1lContent	2lConfident		4lGrateful
1lCaring	2lFaithful	3lTrusting	4lTrusting
1 Grateful	2lImpressed	3lConfident	4lConfident
1 Trusting	2lSurprised	3lFaithful	4lFaithful
1 Confident	2INeutral	3IImpressed	4lImpressed
1 Faithful		3lSurprised	4lSurprised
1 Surprised	2lAgreeing	3INeutral	4lNeutral
Terrified	2lAcknowledging	31Agreeing	4lAgreeing
1Afraid	2lEncouraging	3lAcknowledging	
	2lConsoling	3lEncouraging	41Acknowledging
11Apprehensive	2lSympathizing		4lEncouraging
1 Auxious		3lConsoling	4lConsoling
1IEn barrassed	2lSuggesting	3lSympathizing	4lSympathizing
		3lSuggesting	4lSuggesting
1 Astramed		3lQuestioning	66
The Islamid	2lQuestioning	3lWishing	
	2.Questioning	3l'Terrified	4 Questioning
1 IDev stated		3lAfraid	i quinting
		3lApprehensive	
1lSad	2lWishing	3lAnxious	4lWishing
	2lTerrified	3lEmbarrassed	4/Terrified
11Disappointed	2lAfraid	3lAshamed	4 Afraid
	2lApprehensive	3IDevastated	4 Apprehensive
1lLonely	2lEmbarrassed		4 Embarrassed
Inconvity	2lAshamed	3lSad	4 Ashamed
	2lDevastated	3IDisappointed	4 Devastated
1 Sen imental	2lSad	on bio supported	4 Sad
1lNortalgic	2lDisappointed	3lLonely	4IDisappointed
1lGu lty	2lLonely		4 Lonely
1 Disgusted	2lSentimental	3lSentimental	4 Sentimental
1lFurious	2lNostalgic	3lNostalgic	4 Guilty
11/ingry	2lGuilty	3lGuilty	4 Furious
1 Annoyed	2lDisgusted	3lDisgusted	4lAngry
IJealous	2lFurious	3lFurious	4/Annoyed
-	2lAngry	3lAngry	4Jealous
	2lAnnoyed	3lAnnoyed	Tistaitus
	2lJealous	3lJealous	
Turn 1 (Sp)	Turn 2 (Ls)	Turn 3 (Sp)	Turn 4 (Ls)

Empathetic Response Generation for Distress Support

SigDial 2023

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EPFL Frequent emotion-intent flow patterns

speaker	Listener	speaker	Listener
	2lPrepared	3lPrepared	
	2lHopeful	3lAnticipating	4lPrepared
	2lProud	3lHopeful	41Anticipating
1 Prepared	2lJoyful	3lProud	4 Hopeful
1 Anticipating	2lContent	3lExcited	4lProud
1lHopeful	2lCaring	3lContent	4 Content
1lProud	2lGrateful	3lCaring	4lCaring
llJoyful	2lTrusting 2lConfident	3lGrateful	4lGrateful
1lContent	2/Confident 2/Faithful	3lTrusting	4 Trusting
1lCaring	2ll'althui 2lImpressed	3lConfident	4lConfident
1 Grateful	2lSurprised	3lFaithful	4 Faithful
1/Trusting	2lSulplised 2lNeutral	3IImpressed	4IImpressed
1 Confident	Zilveural	3 Surprised	4lSurprised
1lFaithful	2lAgreeing	3INeutral	4lNeutral
1 Surprised	2lAcknowledging	3 Agreeing	
UTerrified DAfraid	2/Acknowledging 2/Encouraging	3lAcknowledging	4lAgreeing
	2lConsoling		4lAcknowledging
Apprehensive		3lEncouraging	4lEncouraging
11Auxious	2lSympathizing	3lConsoling	4lConsoling
1 En barrassed	2lSuggesting	3lSympathizing	4lSympathizing
		3lSuggesting	4 Suggesting
Ashamed		3lQuestioning	in a get and
	2lQuestioning	3lWishing	
	2. Questioning	3lTerrified	4lQuestioning
1IDev stated		3lAfraid	A Contraction of the second se
		3lApprehensive	
Sad	2lWishing	3lAnxious	4lWishing
	2l'Terrified	3lEmbarrassed	4/Terrified
11Disappointed	2lAfraid	3lAshamed	4lAfraid
	2 Apprehensive	3IDevastated	4lApprehensive
Lonely	2lEmbarrassed		4lEmbarrassed
	2lAshamed	3lSad	4lAshamed
1 Sen imental	2lDevastated 2lSad	3IDisappointed	4lDevastated
1 Nortalgic			4lSad
1 Gu lty	2lDisappointed	3lLonely	4lDisappointed
1 Disgusted	2lLonely 2lSentimental	3lSentimental	4lLonely
1)Furious	2lSentimental 2lNostalgic	3lNostalgic	4lSentimental
11 mous 11/ ngry	2lGuilty	3lGuilty	4lGuilty
1 Annoved	2lOunty 2lDisgusted	3lDisgusted	4lFurious
AlJealous	2lFurious	3lFurious	4lAngry
	2lAngry	3lAngry	4lAnnoyed
1 All	2lAngry 2lAnnoyed	3lAnnoyed	4lJealous
	2lJealous	3lJealous	
Turn 1 (Sp)	Turn 2 (Ls)	Turn 3 (Sp)	Turn 4 (Ls)

EPFL **Frequent emotion-intent flow patterns**

speaker	Listener	speaker	Listener
IIPrepared IIAnticipating IIHopeful IIProud IIJoyful IIContent IIC	2)Prepared 2)Hopeful 2)Proud 2)Joyful 2)Content 2)Content 2)Carateful 2)Grateful 2)Grateful 2)Faithful 2)Faithful 2)Faithful 2)Impressed 2)Surprised 2	 3lPrepared 3lAnticipating 3lHopeful 3lHopeful 3lProud 3lExcited 3lContent 3lCarteful 3lTrusting 3lGrateful 3lTrusting 3lGrateful 3lImpressed 3lSuprised 3lNeutral 3lAcknowledging 3lAcknowledging 3lSympathizing 3lSugesting 3lWishing 3lTerrified 3lAprehensive 3lAntraid 3lAprehensive 3lAnxious 3lEmbarrassed 3lAshamed 	4lPrepared 4lAnticipating 4lHopeful 4lProud 4lContent 4lCaring 4lCrateful 4lTrusting 4lConfident 4lFaithful 4lTrusting 4lConfident 4lFaithful 4lTrusting 4lSurprised 4lSurprised 4lSurprised 4lSurprised 4lSurprised 4lAcknowledging 4lEncouraging 4lEncouraging 4lSnggesting 4lSuggesting 4lSuggesting 4lQuestioning 4lVishing 4lTerrified 4lAprochensive
Lonely ISenimental INotalgic UNotalgic UDisgusted IPerious UAnnoyed IBealous	21Embarrassed 21Ashamed 21Devastated 21Disappointed 21Disappointed 21Disappointed 21Conely 21Sentimental 21Nostalgic 2Guilty 21Disgusted 21Furious 21Angry 21Annoyed 21Jealous Turn 2 (Ls)	3IDevastated 3ISad 3IDisappointed 3ILonely 3ISentimental 3INostalgic 3IGuilty 3IDisgusted 3IFurious 3IAnnyy 3IAnnyed 3IJealous Turn 3 (Sp)	41Embarrassed 41Embarrassed 41Bad 41Devastated 41Sad 41Disappointed 41Sad 41Disappointed 41Sad 4

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EPFL Frequent emotion-intent flow patterns

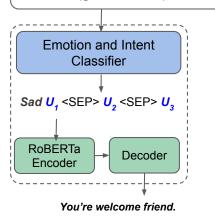
speaker	Listener	Listener speaker			
1 Prepared 1 Anticipating 1 Hopeful 1 Proud 1 Joyful 1 Content 1 Caring 1 Grateful 1 Trusting 1 Confident 1 Faithful 1 Surprised	2lPrepared 2lHopeful 2lProud 2lJoyful 2lContent 2lCaring 2lCarteful 2lTrusting 2lConfident 2lFaithful 2lSurprised 2lSurprised 2lSurprised	Heppared Anticinatine Hopeful 3Ppod 3Excited 3Cohtent 3Co	4lPrepared 4lAnticipating 4lHopeful 4lProud 4lContent 4lCaring 4lCrateful 4lTrusting 4lConfident 4lFaithful 4lFaithful 4lSurprised 4lNeutral		
Internified Adfraid Apprehensive IIA xious IEIE barrassed Ashamed IIDev stated	21Acknowledging 21Encouraging 21Consoling Sympathizing Suggesting Questioning	31Agreeng 31Acchowledging 31En ouraging 31Consoling 31S mpathizing 31Suggesting 31S	4lAgreeing 4lAcknowledging 4lEncouraging 4lSympathizing 4lSuggesting 4lQuestioning		
Sad 11Disappointed Lonely 11Sen imental 11Nortalgic 11Gulty 11Disgusted 11Frious 11Amgry 11Amgry	2lWishing 2lTerrified 2lAfraid 2lAfraid 2lApprehensive 2lEmbarrassed 2lAshamed 2lDevastated 2lSad 2lDisappointed 2lLonely 2lSentimental 2lNostalgic 2lGuilty 2lDisgusted	3/Anxious 3/Embarrassed 3/Ashamed 3/Devastat	4lWishing 4lTcrrified 4lAfraid 4lApprehensive 4lEmbarrassed 4lDevastated 4lDevastated 4lDisappointed 4lLonely 4lSentimental 4lGuilty 4lFurious 4lAngry		
Turn 1 (Sp)	2lFurious 2lAngry 2lAnnoyed 2lJealous Turn 2 (Ls)	3lFurious 3lAngry 3lAnnoyed 3lJealous Turn 3 (Sp)	4IAngyd 4IAnnoyd 4IJealous Turn 4 (Ls)		



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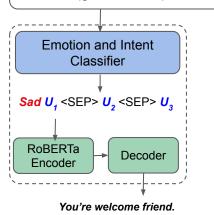
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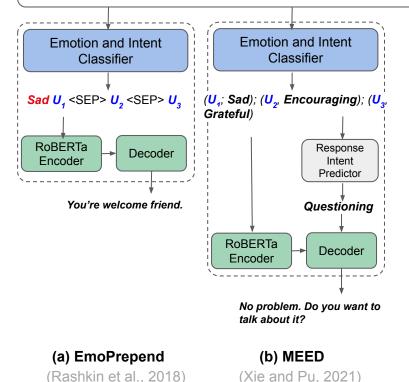


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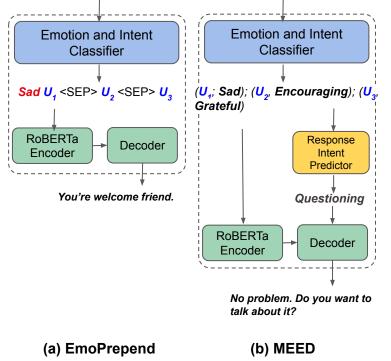
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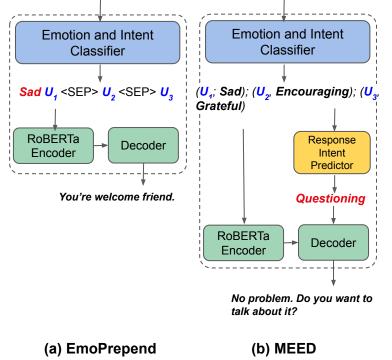


(Xie and Pu, 2021)



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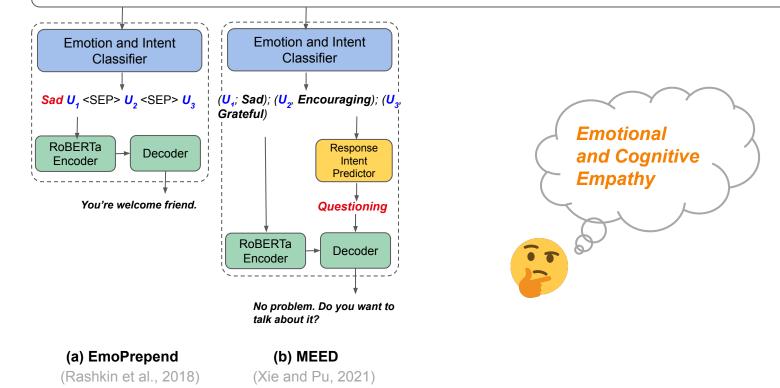
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- Recognizes 3 empathetic communication mechanisms:

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Emotional Reactions

- Expressing emotions such as warmth, compassion, and concern
 - E.g.
 - Everything'll be fine.
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 - E.g.
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EPFL EPITOME (Sharma et al., 2020)

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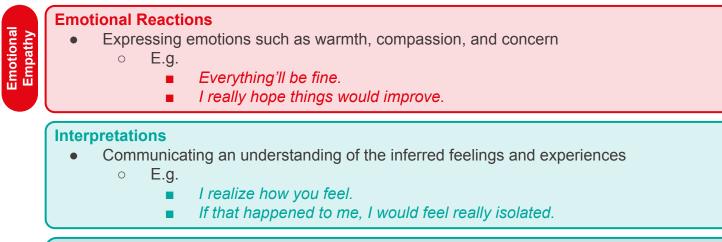
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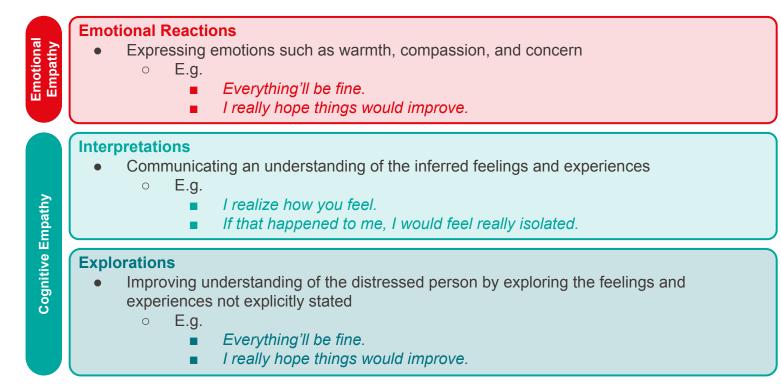
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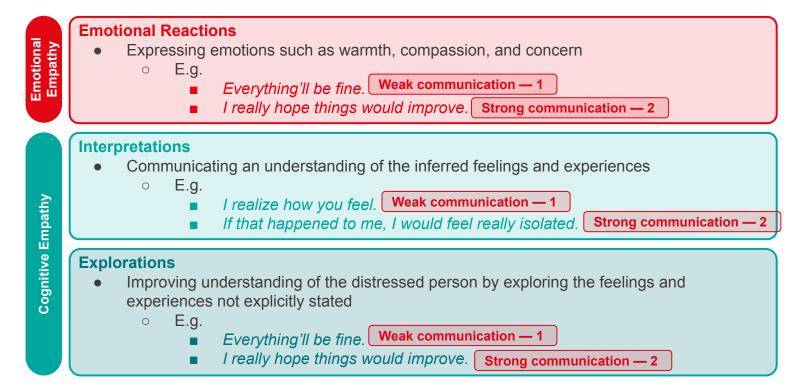
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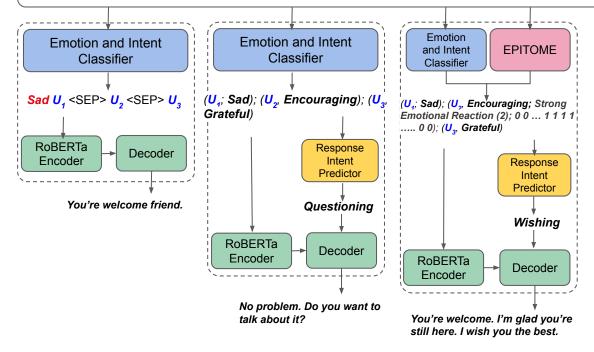
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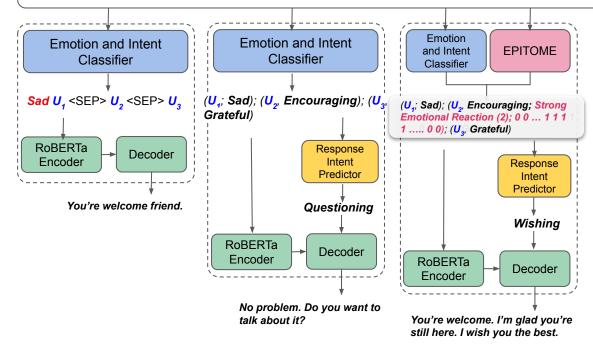


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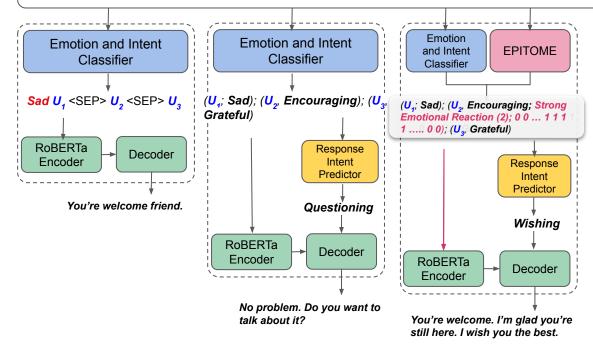
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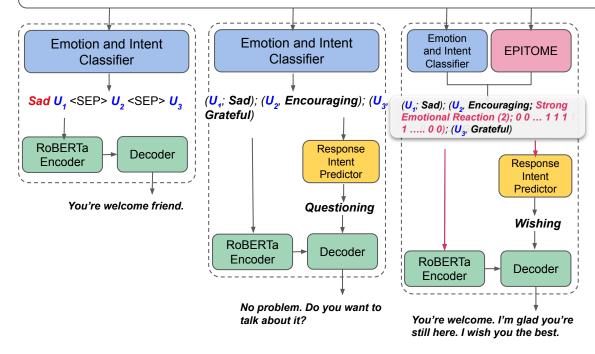


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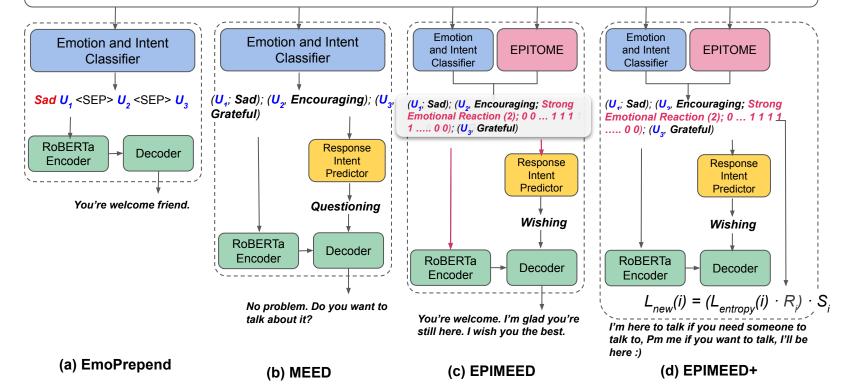


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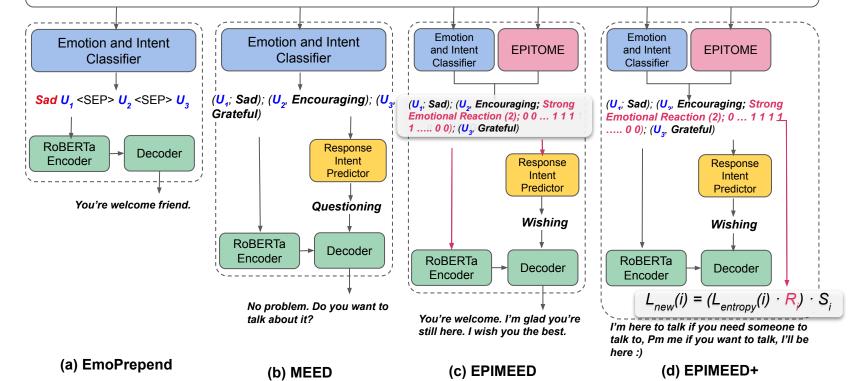
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EPFL Automatic Evaluation

	Diversity	y metrics	Word-overlap metrics			Embedding-based metrics			
	Distinct-1	Distinct-2	BLEU1	BLEU2	ROUGE-L	METEOR	Skip Thought	Embedding Average	Average length (# tokens)
EmoPrepend	0.0317	0.1178	0.0513	0.0157	0.0662	0.0434	0.4842	0.7346	16.55
MEED	0.0618	0.2889	0.0283	0.0123	0.0690	0.0331	0.4874	0.7408	9.68
EPIMEED	0.0487	0.1912	0.0271	0.0110	0.0746	0.0365	0.4911	0.7285	10.30
EPIMEED+	0.0039	0.0181	0.0543	0.0191	0.0559	0.0637	0.4268	0.7650	40.82

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EPFL Automatic Evaluation: EPITOME

	Emotional Empathy	Cognitive Empathy		
	Emotional Reactions	Interpretations	Explorations	Total
EmoPrepend	1.148	0.216	0.364	1.728
MEED	0.464	0.412	0.520	1.396
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- Evaluate the "Empathetic Appropriateness"

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in o d	eel so lonely sometimes because all my friends live
mat	lifferent country
accordi	d drop the below responses into "Good", "Okay", and "Bad" ng to your judgement on how empathetically appropriate they are to ier dialogue.
Good:	
Okay:	
Bad:	
🚹 Drag	and drop
Why is	that?
	erry to hear that . do you have any friends that you can hang out with ?
_	
_	ou.

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Good:	
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Why is tha	1?
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hi i feel	so lonely sometimes because all my friends live
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Drag and d according the earlier	rop the below responses into "Good", "Okay", and "Bad" to your judgement on how empathetically appropriate they are f dialogue.
Good:	
Okay:	
Okay.	
okay.	
okay.	
Bad:	
Bad:	i drop
Bad:	1 drop
Bad:	
Bad: 1 Drag and Why is that	
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- Using Amazon Mechanical Turk (AMT)
- Evaluate the "Empathetic Appropriateness"

hi, i feel	so lonely sometimes because all my friends live
in a diffe	erent country
	lrop the below responses into "Good", "Okay", and "Bad" to your judgement on how empathetically appropriate they are t dialogue.
Good:	
Okay:	
Okay:	
Okay:	
Okay:	
Okay: Bad:	
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	d drop
Bad:	
Bad: Drag an Why is that	
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- Using Amazon Mechanical Turk (AMT)
- Evaluate the "Empathetic Appropriateness"
- Logistics:
 - 200 dialogue prompts from RED test set, bundled into 20 HITs (Human Intelligence Tasks)
 - 3 workers per HIT

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	Good	Okay	Bad	²⁄₃ Observed Agreement
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MEED	83.42%	16.58%	0.00%	99.50%
EPIMEED	74.07%	25.93%	0.00%	94.50%
EPIMEED+	42.14%	25.16%	30.70%	79.50%

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EPFL Case Study



My cat died today, and I can't get it out of my mind. I keep think of him running on a sunny hill but that only makes me cry more

I'm so sorry you're going through this



EmoPrepend

I'm sorry for your loss. (Sympathizing)



I'm so sorry for your loss. (Sympathizing)



I'm so sorry for what you're going through. I hope you'll be able to reach out to someone who's going through something similar. Have you looked into getting help? (Sympathizing)



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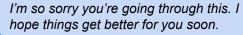


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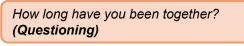


School is almost over. Things still haven't fixed with my best friend. I want to talk to her about it but I fear it'll just make my situation worse than it already is.





EmoPrepend





Do you want to talk about it? (Questioning)



Wanna talk about it? I'm here if you want to talk about it. I'm here to listen if you need someone to talk to. You're not alone. **(Questioning)**



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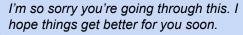


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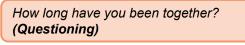


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 - ≈1.3M distress support dialogues
 - > 4K distress topics

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 - Reddit commenters are not professionals!
 - Caution must still be taken if these conversations are directly used for training automatic systems

Thank You



Our code and dataset available at: https://github.com/yehchunhung/EPIMEED

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Appendices

EPFL Reddit Emotional Distress (RED) Dataset

- Scraping conversational data from peer support platform, Reddit
- Why Reddit?
 - Anonymity on Reddit encourages open discussion of often stigmatized psychological concerns and personal distress (De Choudhury and De, 2014; Sharma et al., 2017)
 - Dialogues are publicly available in abundance, allows scraping through web APIs
 - Contain higher empathic concern as many peers share similar distressful experiences (Hodges et al., 2010)

EPFL EPITOME (Sharma et al., 2020)

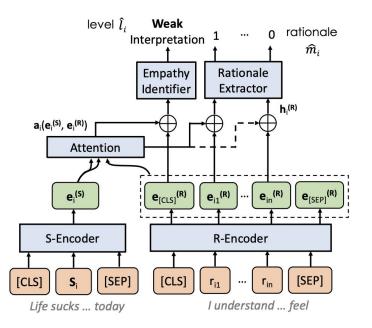


Figure 2: We use two independently pre-trained RoBERTa-based encoders for encoding seeker post and response post respectively. We leverage attention between them for generating seeker-context aware representation of the response post, used to perform the two tasks of empathy identification and rationale extraction.

$$\mathbf{e}_{i}^{(\mathbf{S})} = \text{S-Encoder}([\text{CLS}], \mathbf{S}_{i}, [\text{SEP}])$$
$$\mathbf{e}_{i}^{(\mathbf{R})} = \text{R-Encoder}([\text{CLS}], \mathbf{R}_{i}, [\text{SEP}])$$

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EPFL Example Dialogue Responses

Speaker: Back then I used to be all cheery, and went through my day. Now I just sit at my chair, looking down on myself, and sleeping days away. I reflect on myself no matter what, especially how I am around other people. I just lost all drive to do anything. I just want to lay down, and wish death.

EmoPrepend	I'm so sorry you're going through this. You talked to anyone in your life about any of the stuff you're going through?
MEED	What kind of stuff is making you feel this way? (Questioning)
EPIMEED	Do you want to talk about it? (Questioning)
EPIMEED+	I've been in a similar situation. You're not alone. Did you tell anyone what you're going through or looked into getting help? (Questioning)

Speaker: I want out. I want to shoot someone, I want to be shot. I don't know what the fuck I want, I know exactly what I want. I want someone to shoot me, I don't want a new prescription doc, I want to be f^{**} ing shot.

EmoPrepend	What country do you live in?
MEED	Why do you want to do this? (Questioning)
EPIMEED	Why would you want to do this? (Questioning)
EPIMEED+	What's going on in your life? I'm here to talk if you want to talk. PM me if you need someone to talk to. (Questioning)

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EPFL Example Dialogue Responses

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Speaker: I don't have one friend, when my family come into this house all they do is look threw me. No one talks to me unless it's something perverted online. I feel terrible.

EmoPrepend	I'm sorry you're going through this.
MEED	How old are you? (Questioning)
EPIMEED	I'm here if you want to talk. What's going on? (Questioning)
EPIMEED+	What's making you feel this way? I'm here if you need someone to talk to. (Questioning)

Speaker: I'm dealing with severe anxiety. I feel like I'm failing my fiance. Sorry for rambling but I just feel like giving up. I just feel like I can't win.

Listener: I'm going through a similar situation. I also feel like I'm failing at life.

Speaker: Well, I guess we can at least go down swinging. At least I'm not alone.

EmoPrepend	I'm sorry you're going through this.
MEED	You're not alone. (Agreeing)
EPIMEED	That's a good point. (Acknowledging)
EPIMEED+	You're not alone. I'm in the same boat. I can relate to this. I wish you'd be happy to talk to me if you want to talk about it. (Acknowledging)

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EPFL Example Dialogue Responses

Speaker: I just want to be dead, I don't want to live in this shitty world, I want to be released. I'm planning to kill myself later in life. Nobody will notice about my success.

EmoPrepend	I'm so sorry you're going through this. I hope things get better for you soon.
MEED	Why do you want to die? (Questioning)
EPIMEED	Please don't. Why do you feel this way? (Questioning)
EPIMEED+	Why do you want to kill yourself? Why do you feel like you want to do this? Have you told anyone what you're going through or looked into getting help? If you want to talk I'm here. (Questioning)

Speaker: They say one person eventually gets attached, Funny how it's always me..

Listener: How did it become that?

Speaker: Cos I'm a very emotional person who gets attached very easily. I eventually become some side pet in any relationship.

EmoPrepend	I'm so sorry you're going through this.
MEED	Are you in an open relationship? (Questioning)
EPIMEED	That's why I don't want any relationship. (Neutral)
EPIMEED+	I'm sure you're not the only one. I'm here to talk if you need to talk. (Neutral)