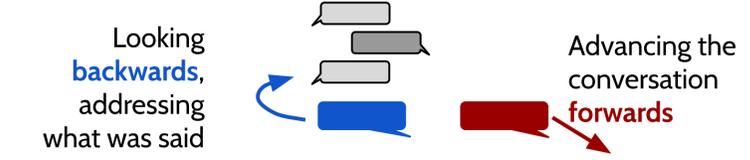


Modeling the balance of conversational objectives

The flow of a conversation is shaped by different choices its participants make.



Striking a balance between these choices is important and challenging.

A demonstrative, high-stakes setting: **crisis counseling**

Overall goal: help an individual in mental crisis

Objective: address the situation, establishing an empathetic understanding

Objective: advance to a calmer state

when i tell my mom about the bullies she just ignores me

That sounds so frustrating, you deserve to be listened to.

Have you confided to anyone else about this?

she just tells me to get over it

yeah, there's my sister

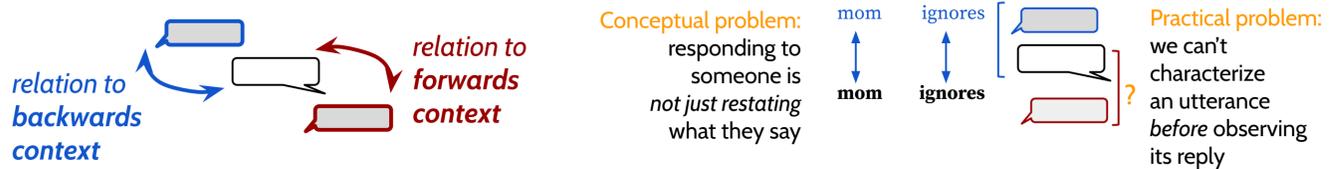
risk: stalling the conversation

risk: rushing the conversation

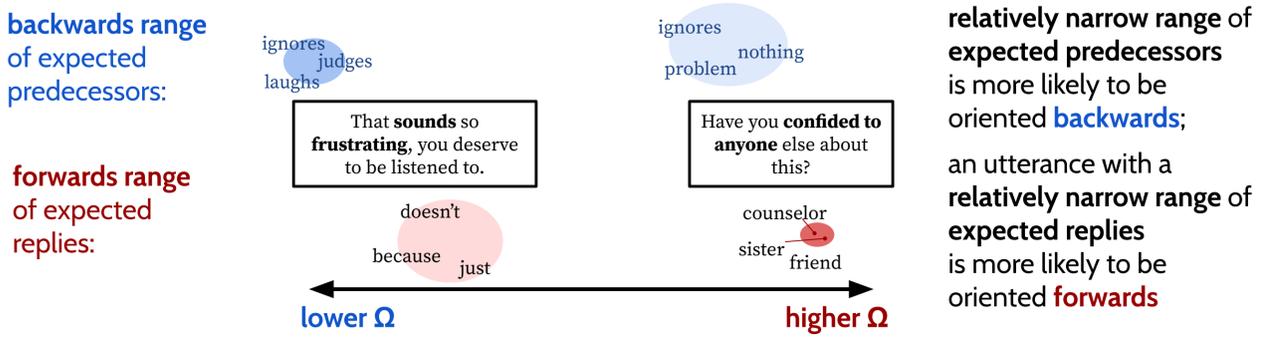
We compare how much an utterance aims backwards versus forwards.

Intuition: characterize utterances using their **conversational context**.

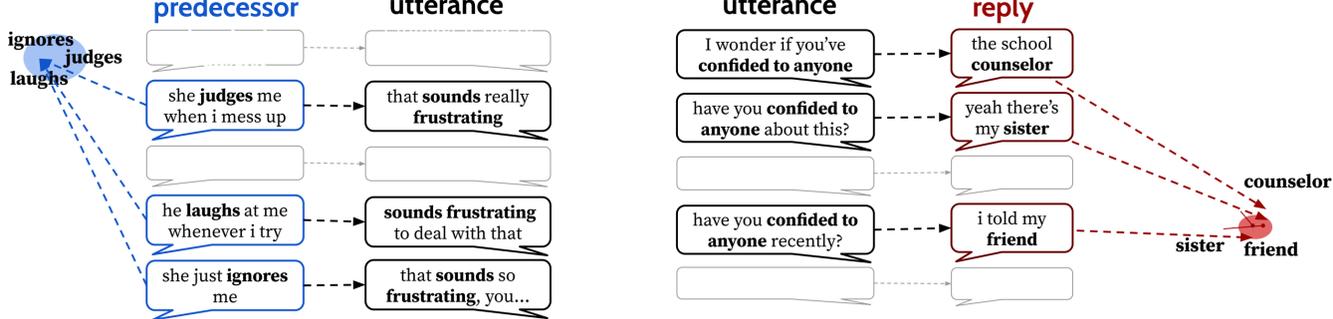
A naive attempt: directly compute similarity between an utterance and its predecessor/response.



Our key idea: comparing expectations about replies and predecessors



We set these expectations using conversations in the data:



Our approach: an unsupervised method for computing an utterance's forwards and backwards ranges, and its orientation

A. Input: observed texter replies to counselor utterances

B. Derive vector representations of texter utterances

$\mathcal{X} \approx U S V^T$ where \mathcal{X} is a tf-idf reweighted term-document matrix of all texter utterances

C. Derive central points

$\vec{u}_w = w_w^T U_w S^{-1}$ where w_w^t is the tf-idf weight of w in c_i

D. Compute forwards-range

$\vec{\sigma}_w = \text{avg}_{u \in U_w} \langle \vec{u}_w, u \rangle$ where $\langle \cdot, \cdot \rangle$ is the cosine distance between \vec{u}_w and u

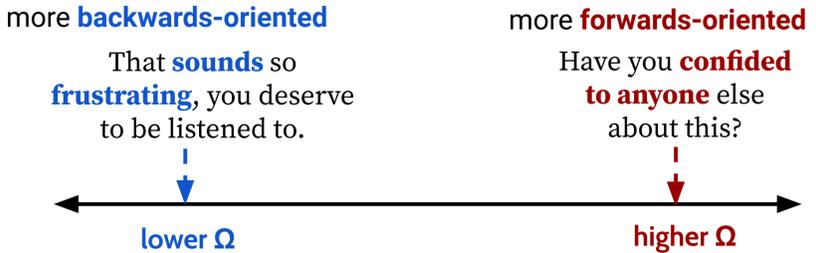
E. Compute orientation:

$\Omega_w = \vec{\sigma}_w - \vec{\sigma}_w$

Methodology extends approach from EMNLP 2017 paper

Our goal: quantify how conversationalists manage this balance.

We model the balance of objectives as a continuous axis, **orientation**:



Papers referenced:
 Justine Zhang and Cristian Danescu-Niculescu-Mizil. 2020. Balancing Objectives in Counseling Conversations: Advancing Forwards or Looking Backwards. In Proceedings of ACL.
 Justine Zhang, Arthur Spirling, and Cristian Danescu-Niculescu-Mizil. 2017. Asking too much? The rhetorical role of questions in political discourse. In Proceedings of EMNLP.

Application:

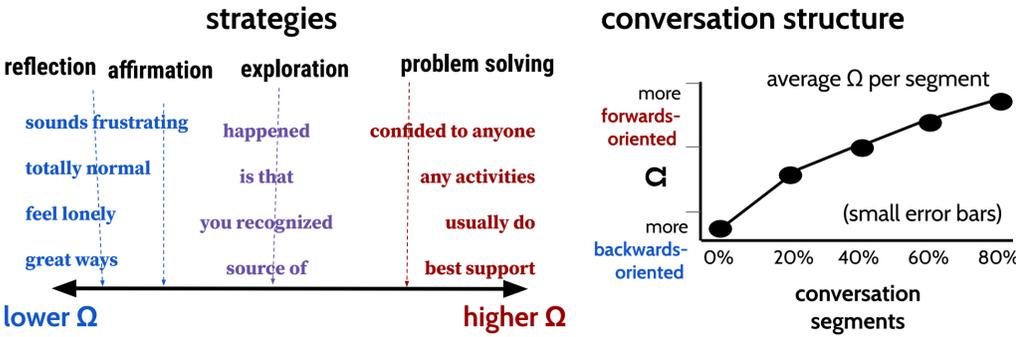
CRISIS TEXT LINE

~1.5 million conversations

anxiety
 suicidal ideation
 relationship problems
 depression
 [...]

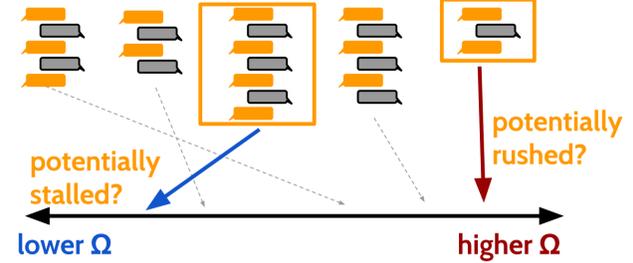
texter counselor

Sanity check: orientation corresponds to domain knowledge taught to counselors:



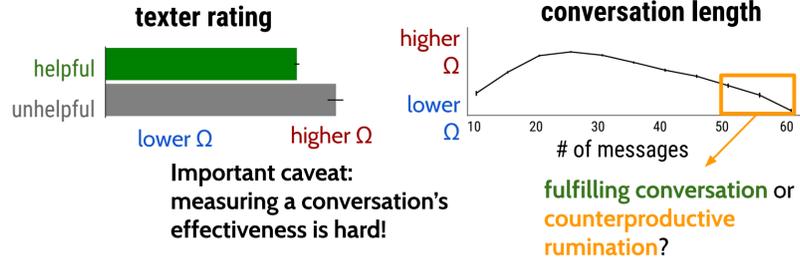
Can measuring orientation help in counseling?

Example application: helping supervisors monitor conversations



Feasibility check: Does orientation relate to other conversational indicators?

Average counselor orientation in a conversation, for different indicators:



Important caveat: measuring a conversation's effectiveness is hard!

Ask me more about: **More nuanced modeling of conversational dynamics**
Causal inferences (and why they're hard to make)