

Tone Flow Visualization for Customer Care Conversation Analysis

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Background



call center



conversations

Motivation

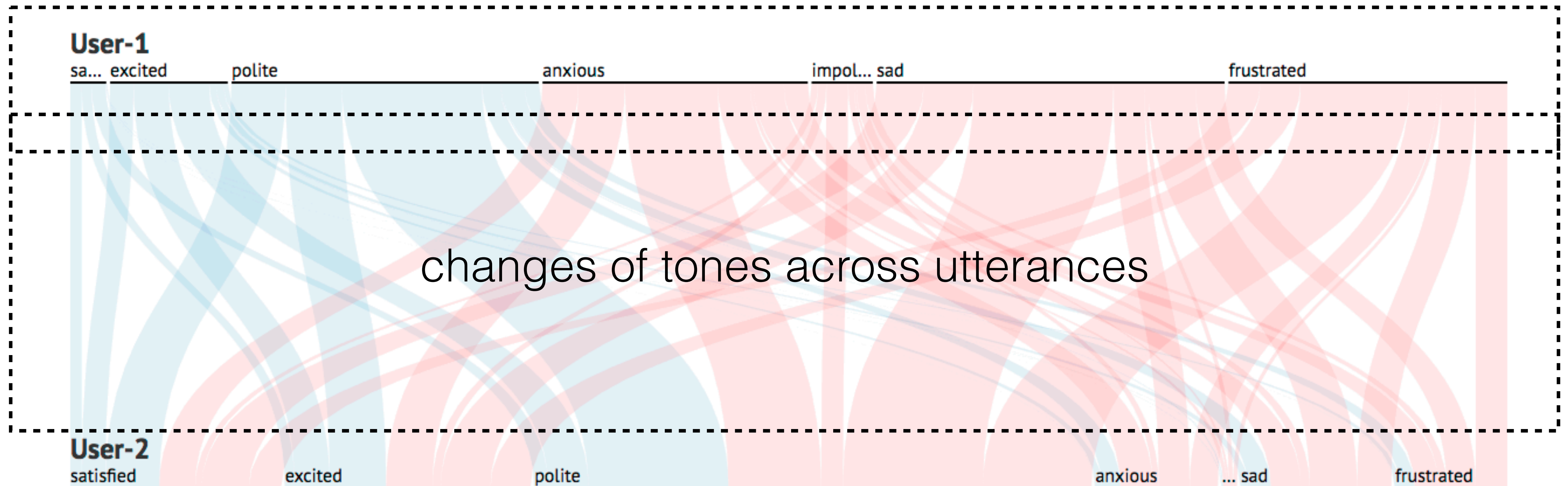
- Quality monitoring (QM) of call conversations is challenging
 - call centers follow QM questionnaires
 - unscalable to monitoring all conversations
 - high disagreement on the assessment due to bias
- The reasons of high or low quality calls are unknown
- Difficulty in agent training to ensure the quality standards

Our Approach

- A visual analytic approach to understanding call conversations based on dynamic tones
 - identifying conversations that went well versus not using tones
 - visually tracking changes of tones throughout conversations
 - explaining the causes of positive and negative calls

The Tone Flow Visualization

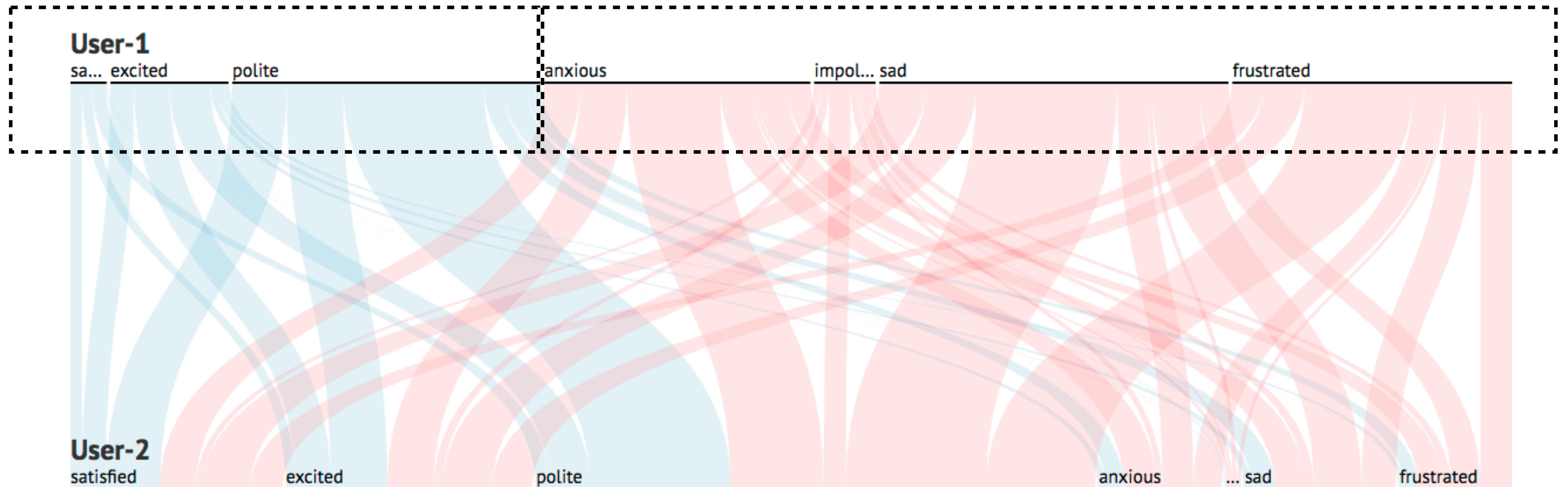
distribution of tones in an utterance



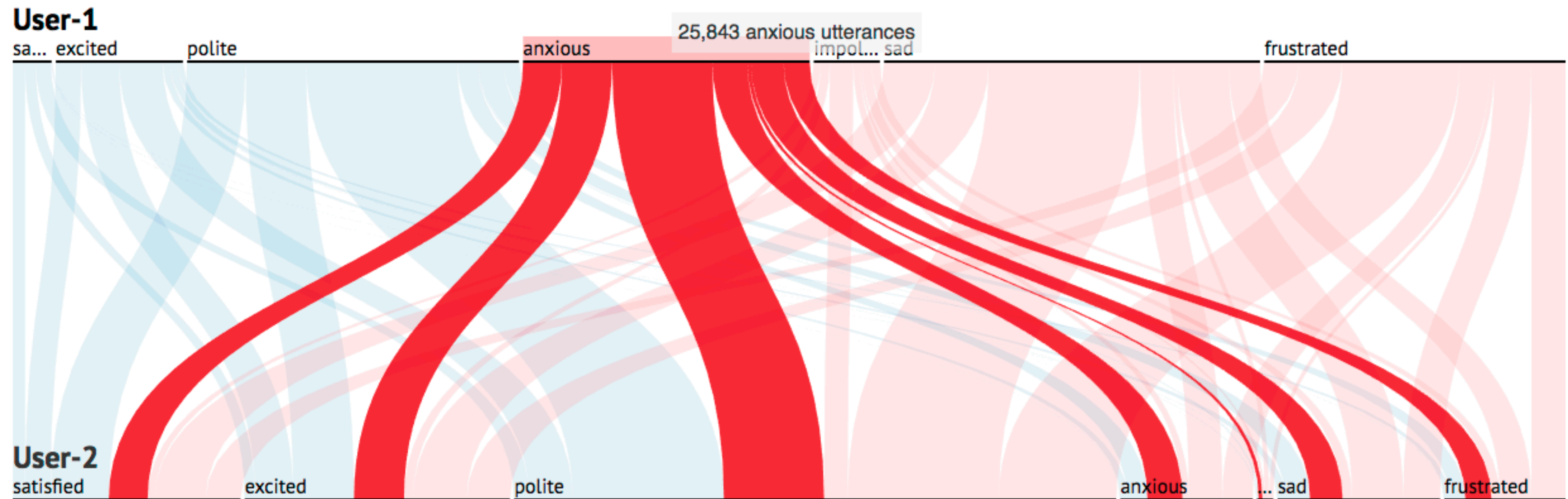
The Tone Flow Visualization

positive tones

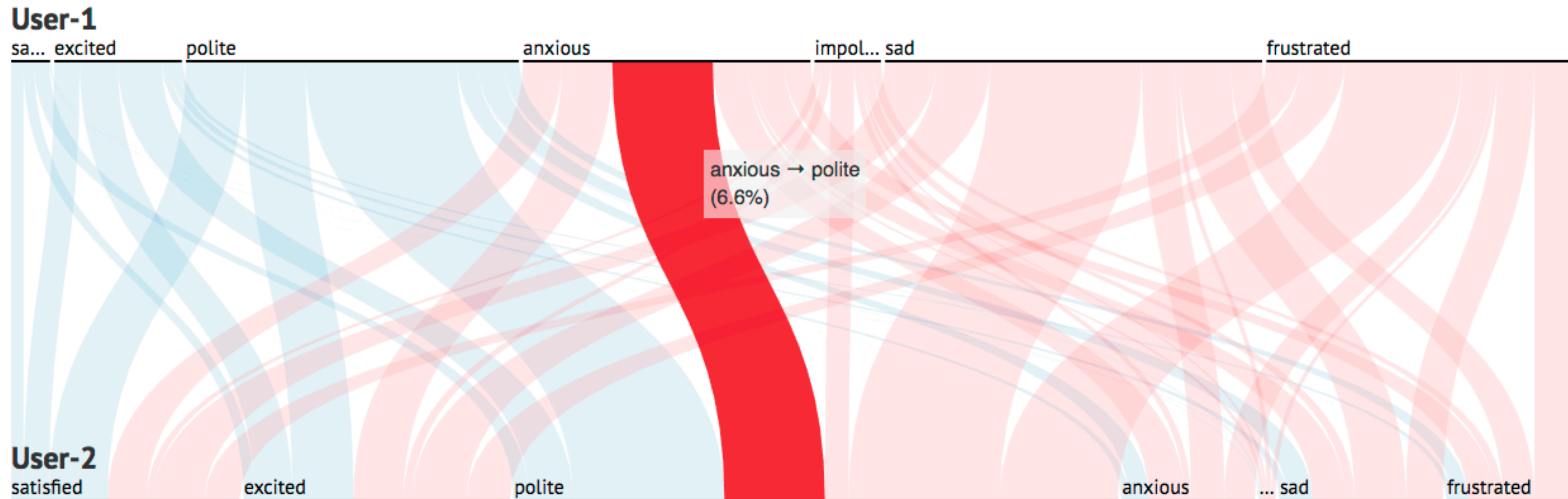
negative tones



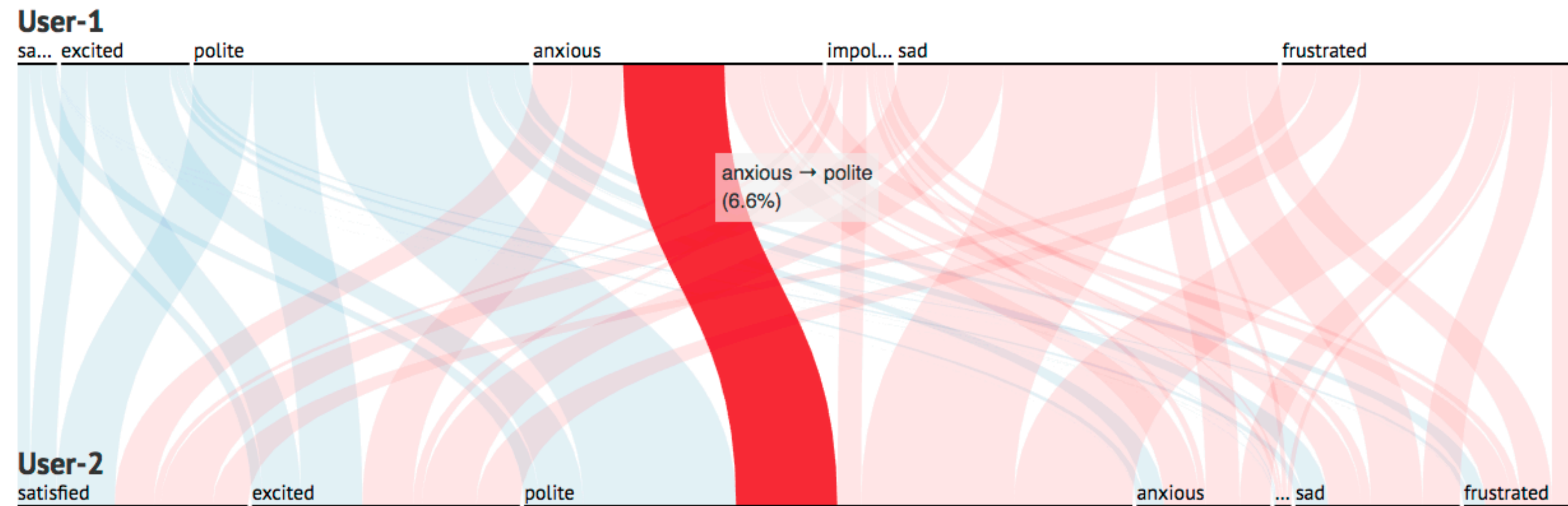
Highlighting tone flow branches



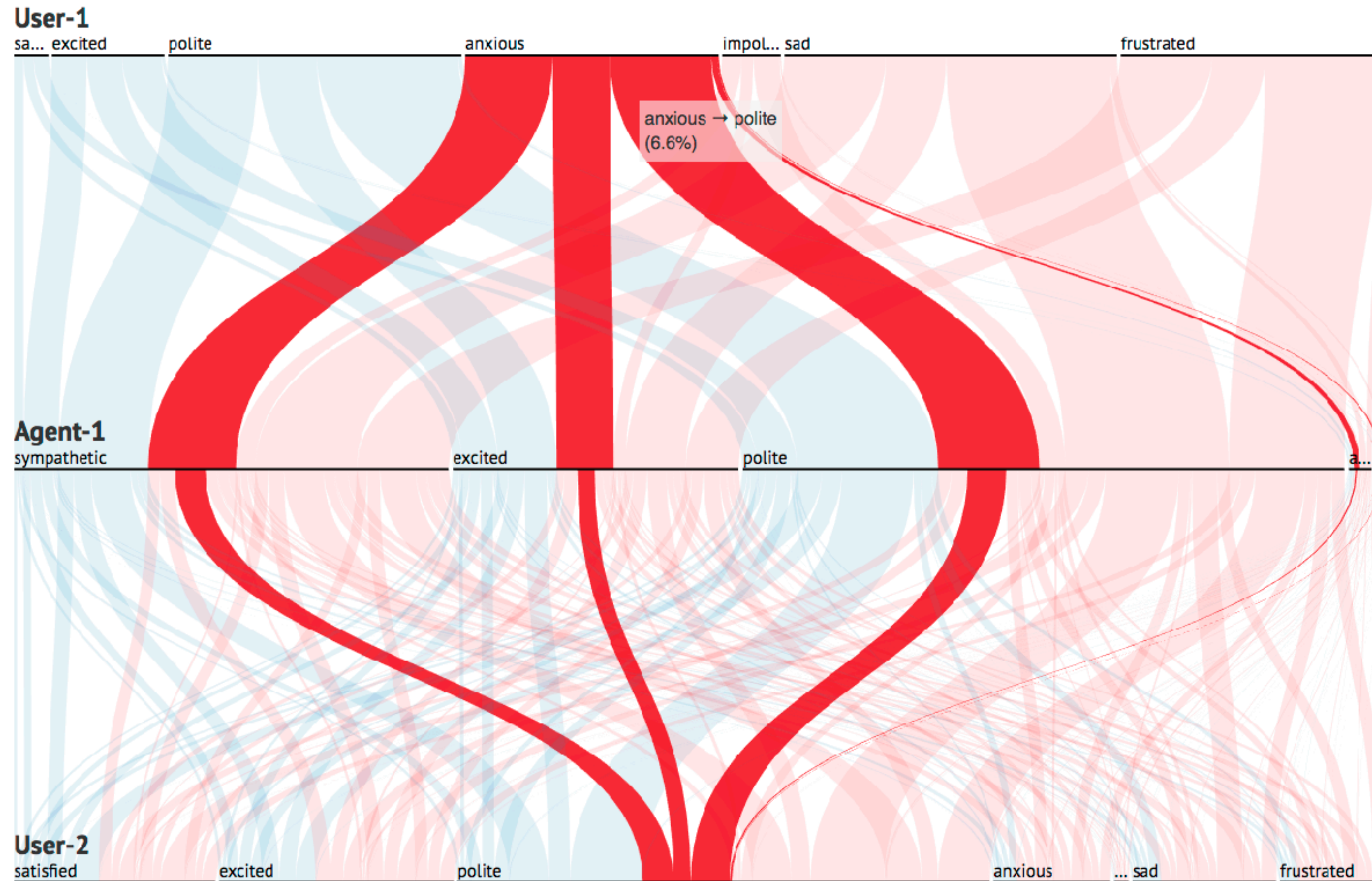
Highlighting one tone flow path



Expanding a tone flow path

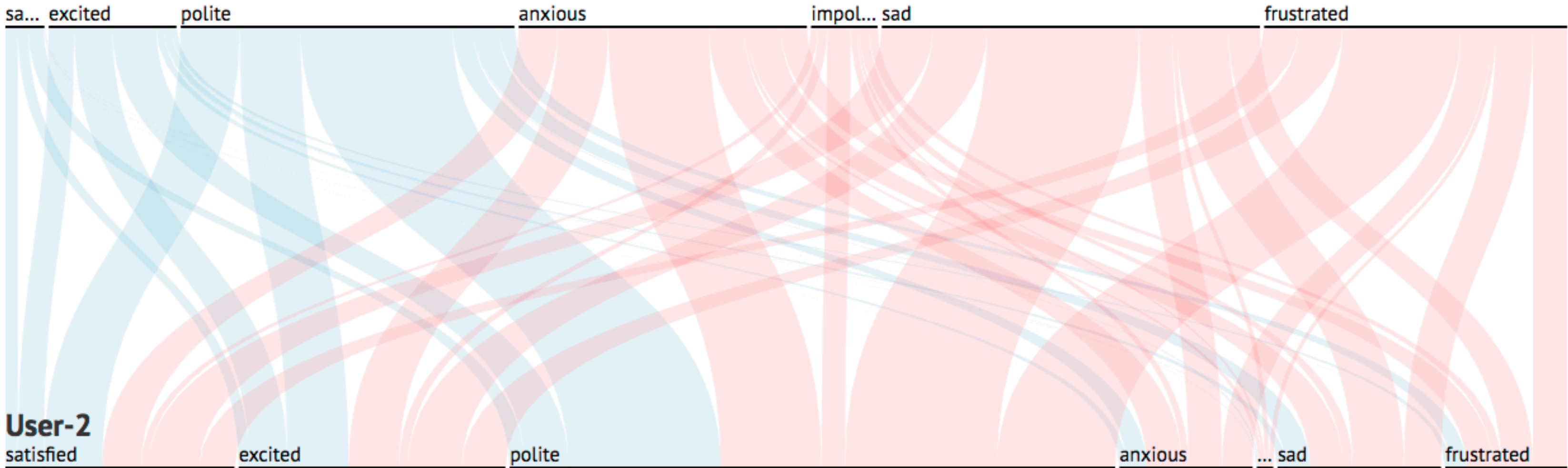


Expanding a tone flow path



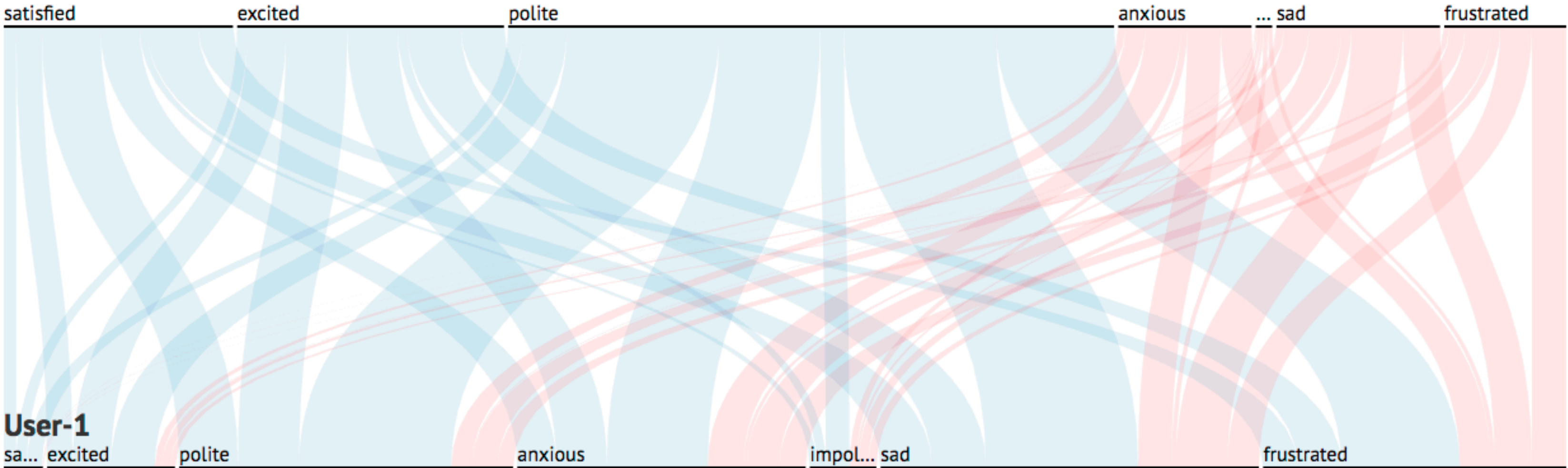
Reversing tone flow

User-1



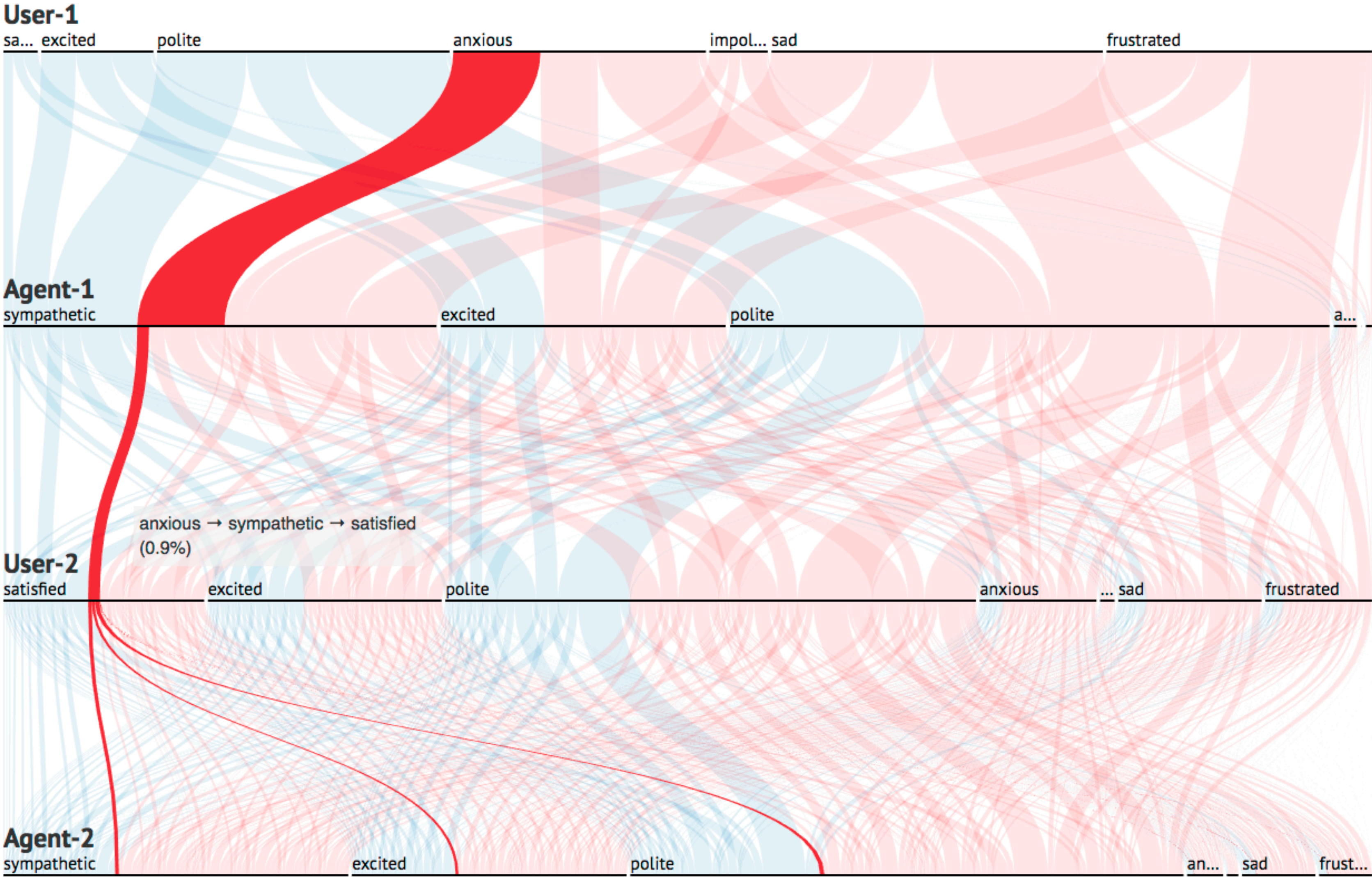
User-2

User-2



User-1

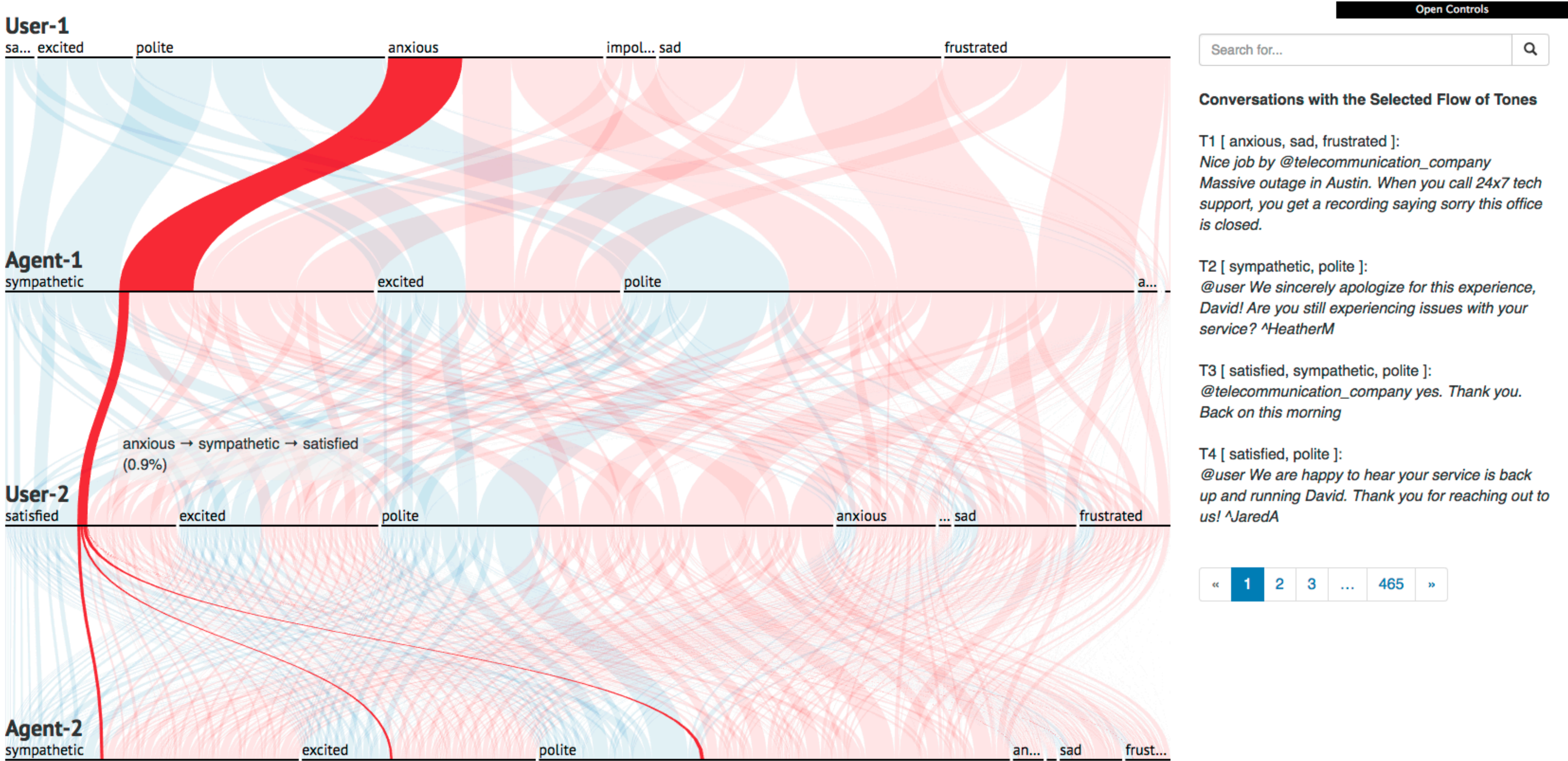
Tracking tone flows between customers and agents



Deeper analysis of tone flow patterns

- Trace tone flow patterns to call conversations
 - visual query based on tone flow paths
- Support keyword-based conversation filtering
 - text query from input keywords
- Connect tone flows with conversation topics (to be refined)
 - topic analysis of conversations

Visual Query: selecting a tone flow path



Text Query: search keywords

User-1

sa... excited

polite

anxious

impol... sad

frustrated

Agent-1

sympathetic

excited

polite

a...

anxious → sympathetic → satisfied
(0.9%)

User-2

satisfied

excited

polite

anxious

... sad

frustrated

Agent-2

sympathetic

excited

polite

an...

sad

frust...

Open Controls

flight



Conversations with the Selected Flow of Tones

- T1 [anxious, sad, frustrated]:
Annoyed at San Antonio. Why isnt my flight boarding for BNA?
- T2 [satisfied, sympathetic, excited, polite]:
@user Sorry to hear that, Katherine. Please send the Flt # and city pairs for an update. ^JB
- T3 [anxious]:
@airline_company im flying 227 SAT to BNA then 3448 BNA to BOS. Im nervous I'm going to miss that connection
- T4 [satisfied, sympathetic, excited, polite]:
@user Flt #227 is scheduled to depart at 6:30 p.m. Boarding for the aircraft should begin soon. ^JB
- T5 [satisfied, sympathetic, excited, polite]:
@airline_company i hope so! The bwi plane is still at our gate 🙏 thanks for looking into it

« 1 2 3 ... 14 »

Next steps

- Interview with customer care experts for qualitative feedback
- Refine current designs based on experts' feedback
- Add potentially useful components (e.g., conversation topics)