Multimodal Database of Negative Emotion Recovery in Dyadic Interactions: Construction and Analysis

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Affective dialogue systems

High potential of dialogue systems to address the emotional needs of users

- Increase of dialogue system works and applications in various tasks involving affect
  - Companion for the elderly
    [Miehle et al., 2017]
  - Distress clues assessment
    [DeVault et al., 2014]
  - Affect-sensitive tutoring
    [Forbes-Riley and Litman, 2012]
Works on emotional problems

- Depression and suicide risk assessment (Cummins et al., 2015)
- Virtual human interviewer for distress clues assessment (DeVault et al., 2014)

Focus on clinical situation, not suitable for common users

Lack of works on negative emotion in everyday situations
Challenge and proposed solution

Lack of resources that
• highlights emotion problems in everyday situation
• involves an expert in the conversation

In this paper
a multimodal database of dyadic interactions between a professional counselor as an expert and 30 participants
Database design
Processing negative emotion through social communication

- Goal: Learning expert dialogue strategy in an affective conversation to recover negative emotion
  - Based on social sharing of emotion [Luminet+, 2000]
- Interaction between an expert and a participant after a negative emotion inducer
  - Expert guides the conversation to allow participant’s emotion recovery

**Recorded Session**

- Briefing
- Opening talk (neutral)
- Emotion induction (negative)
- Emotion processing and recovery (positive)
- Post-recording Questionnaire
- Self-assessment of emotion (SAM)
Emotion Inducer

• Video clips as emotion inducer [Gross+, 1995] [Schaefer+, 2010]
  • Effective and reliable
  • Easy to replicate
  • Less personally involved

• Non-fictional short clips
  • E.g., news report, interview, documentary
  • Avoid unpredictable reactions to fictional clips

• Two target negative emotions: anger and sadness
  • Each emotion target has 10 inducers
# Dyadic Interlocutors

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<tr>
<th><strong>Expert</strong></th>
<th><strong>Participant</strong></th>
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| • An external party who helps facilitate the emotional response and processes of the participant  
  • 1 counselor  
  • An accredited member of British Association for Counseling and Psychotherapy  
  • > 8 years of experience | • Reacting to emotion inducer  
  • Discussing the topic and their reaction with the counselor  
  • 30 participants  
  • 20 males, 10 females  
  • Fluent English speakers (L1 or L2) |
Result
Constructing the corpus

- 23 hours and 41 minutes of data were collected
- Fully annotated
  - Self-reported emotion by participant
  - Perceived emotion by counselor
  - Transcription
- Emotion annotation: Circumplex model of affect [Russel, 1980]
  - Arousal: level of activity of emotion
  - Valence: positivity-negativity of emotion

Emotion annotation with Gtrace [Cowie+, 2000]
Emotion Annotation

![Graphs showing emotion annotation data for valence and arousal over time for two different cases: 0507 and 0207.](image-url)
Post-recording questionnaire

- the emotion inducer videos are effective
- the participants reported positive emotional effect of the conversation
- the conversation helps to process emotion
- the conversation is enjoyable
- the participants feel understood
- emotional connection appears to be the most difficult feeling to achieve
  - possibly due to the limited time and lack of continuity of the interaction, and
- in general, the participants would like to interact with the expert again in the future
Conclusion and future works
Conclusion and Future Works

• We presented recordings between a professional counselor and 30 participants

• Allowing observation of emotion change and how an expert can guide negative emotion processing

• The corpus amounts to 23 hours and 41 minutes of data
  • Fully annotated
  • Analyzed

• In the future
  • Learn expert strategy explicitly
  • Use expert strategy for positive emotion elicitation in a dialogue system
Thank you