

Presentation on

Predicting Depression in Screening Interviews from Latent Categorization of Interview Prompts

Paper Author(s): Alex Rinaldi, Jean E. Fox Tree, Snigdha Chaturvedi

Presentation By:

Sabbir Ahmed Sibli, 20266027

Taniya Sultana, 20266016

Mashphey Bintey Kabir, 20266005

M.Sc. in CSE, BRAC University

Content(s)

- **Background Study**
- **Literature Review**
- **Proposed Model**
- **Experimental Results**
- **Takeaways**
- **Our Points of View**
- **Acknowledgements**



Background Study

- In US, 1 in 5 Adults experience depression in their lifetime.*
- These depressions have many significant risk factors including suicidal behavior.*
- Professional help remains highly stigmatized, time-consuming, inaccessible and expensive.
- **Machine Aided Analysis (MAA)** of screening interview can reduce the complexity of detecting depression efficiently.

* US Psychological Medicine Study 2017-18



Literature Review

- Linguistic development of mental healthcare counsellors (**Zhang et al., 2019**).
- Identification of differences in how people disclose mental illnesses across gender and culture (**De Choudhury et al., 2017**).
- NLP methods for identifying depression (**Morales et al., 2017**).
- Predicting Depression from Twitter Posts (**Resnik et al., 2015**).
- Predicting Depression severity from screening interview data (**Yang et al. 2016**).



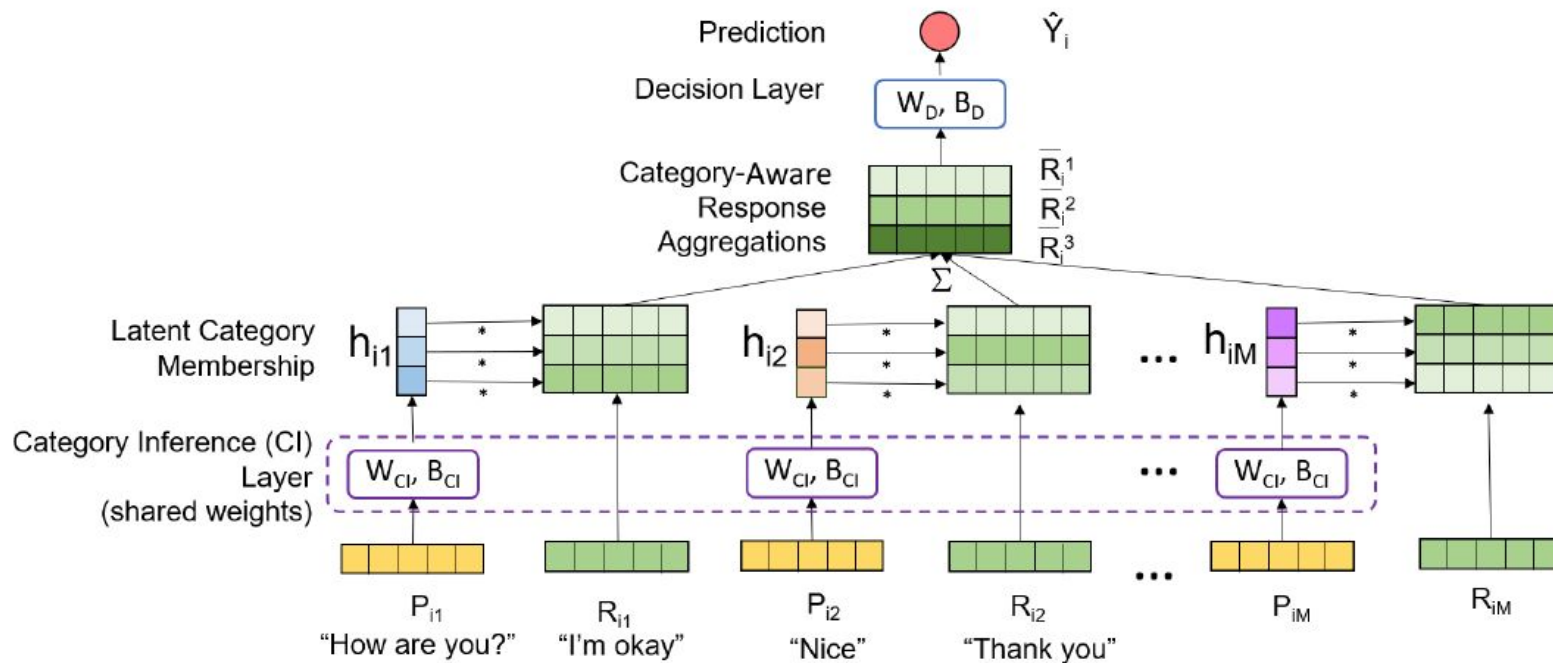
Proposed Model

- **Proposed Model:** Joint Latent Prompt Categorization (JLPC)
- This model is used for predicting depression from interview transcripts provided by the interviewer prompts/speech.
- This Model jointly learns to categorize interviewer statements which are meaningful for analysis.
- Experiments show that the Model outperforms existing competitive baselines.

Proposed Model



Proposed Model



Proposed Model: Dataset

- **Dataset Name:** Distress Analysis Interview Corpus (DAIC)
- Interview named '**Wizard-of-Oz**' conducted by a human controlled virtual avatar, **Ellie**.
- **Interview Duration:** 5-20 minutes.



Fig. Ellie, the virtual interviewer



Experimental Results

Model	F1 Depressed	F1 Not Depressed
Random	0.303 (0.081)	0.690 (0.044)
PO (Prompts Only)	0.246 (0.082)	0.784 (0.032)
RO (Response Only)	0.306 (0.121)	0.798 (0.031)
PR (Prompt-Response)	0.362 (0.080)	0.787 (0.030)
BERT	0.362 (0.080)	0.780 (0.062)
JLPC	0.440 (0.080)	0.768 (0.078)

Table: Experimental Result Comparison with Baselines in term of **Mean F1 scores**



Takeaway

- Depression Prediction is a quite difficult task!
- This research addresses the problem of identifying depression from interview transcripts.
- Mainly interviewer prompts categorization is used to investigate the whole model whereas other models use only interview transcripts or audio-visual data.
- This research may help the community to make more progress in this direction.



Our Point of View

- Prediction depression level from virtual screening interview is very useful procedure, specially during the pandemic time.
- Beside only baselines comparison, A comparative study between several learning and classification algorithms could be shown as a performance study.
- More data should be collected to train models for predicting more accurately.
- Apply of this procedure in public level may bring an inexpensive way to treat the people with mental illness.



Acknowledgements

- **Author(s)**
 - **Alex Rinaldi**, Department of Computer Science, UC Santa Cruz
 - **Jean E. Fox Tree**, Department of Psychology, UC Santa Cruz
 - **Snigdha Chaturvedi**, Department of Computer Science, UNC Chapel Hill
- **Conference:** 58th Annual Meeting of the Association for Computational Linguistics
- **Publication Date:** July 5, 2020
- **Publisher:** Association for Computational Linguistics (ACL)

**“Research is what I am doing when I don’t know
what I am doing”**



- Wernher Von Braun



References

1. Gratch, J., Artstein, R., Lucas, G.M., Stratou, G., Scherer, S., Nazarian, A., Wood, R., Boberg, J., DeVault, D., Marsella, S. and Traum, D.R., 2014, May. The distress analysis interview corpus of human and computer interviews. In *LREC* (pp. 3123-3128).
2. Zhang, J., Filbin, R., Morrison, C., Weiser, J. and Danescu-Niculescu-Mizil, C., 2019. Finding your voice: The linguistic development of mental health counselors. *arXiv preprint arXiv:1906.07194*
3. De Choudhury, M., Gamon, M., Counts, S. and Horvitz, E., 2013, June. Predicting depression via social media. In *Proceedings of the International AAAI Conference on Web and Social Media* (Vol. 7, No. 1).
4. Morales, M., Scherer, S. and Levitan, R., 2017, August. A cross-modal review of indicators for depression detection systems. In *Proceedings of the fourth workshop on computational linguistics and clinical psychology—From linguistic signal to clinical reality* (pp. 1-12).
5. Resnik, P., Armstrong, W., Claudino, L., Nguyen, T., Nguyen, V.A. and Boyd-Graber, J., 2015. Beyond LDA: exploring supervised topic modeling for depression-related language in Twitter. In *Proceedings of the 2nd Workshop on Computational Linguistics and Clinical Psychology: From Linguistic Signal to Clinical Reality* (pp. 99-107).
6. Yang, L., Jiang, D., He, L., Pei, E., Oveneke, M.C. and Sahli, H., 2016, October. Decision tree based depression classification from audio video and language information. In *Proceedings of the 6th international workshop on audio/visual emotion challenge* (pp. 89-96).



Thanks!

Question
Time!

