

# A First Step in Combining Cognitive Event Features and Natural Language Representations to Predict Emotions

**Submission ID** 3000326  
**Submission Type** Poster  
**Topic** Cognitive Science  
**Status** Submitted  
**Submitter** Andres Campero  
**Affiliation** MIT

## SUBMISSION DETAILS

**Presentation Type** Either Poster or Oral Presentation

**Presentation Abstract Summary** We explore the representational space of emotions by combining methods from different academic fields. Cognitive science has proposed appraisal theory as a view on human emotion with previous research showing how human-rated abstract event features can predict fine-grained emotions and capture the similarity space of neural patterns in mentalizing brain regions. At the same time, natural language processing (NLP) has demonstrated how transfer and multitask learning can be used to cope with scarcity of annotated data for text modeling.

The contribution of this work is to show that appraisal theory can be combined with NLP for mutual benefit. First, fine-grained emotion prediction can be improved to human-level performance by using NLP representations in addition to appraisal features. Second, using the appraisal features as auxiliary targets during training can improve predictions even when only text is available as input. Third, we obtain a representation with a similarity matrix that better correlates with the neural activity across regions. Best results are achieved when the model is trained to simultaneously predict appraisals, emotions and emojis using a shared representation.

While these results are preliminary, the integration of cognitive neuroscience and NLP techniques opens up an interesting direction for future research.

**Paper Upload (PDF)** [A first step in combining cognitive event features and natural language representations to predict emotions.pdf](#)

## Co-author Information

\* Presenting Author

First Name	Last Name	Affiliation	E-mail
Andres *	Campero *	MIT	campero@mit.edu

Bjarke	Felbo	MIT	felbo@mit.edu
Josh	Tenenbaum	MIT	jbt@mit.edu
Rebecca	Saxe	MIT	saxe@mit.edu

## Keywords

### Keywords

appraisal theory; emotions; transfer learning