

Dimensional Modeling of Emotions in Text with Appraisal Theories: Corpus Creation, Annotation Reliability, and Prediction

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(1) Motivation

- Emotions can be expressed purely by event descriptions.
- Appraisal theories explain the link between events and emotions.

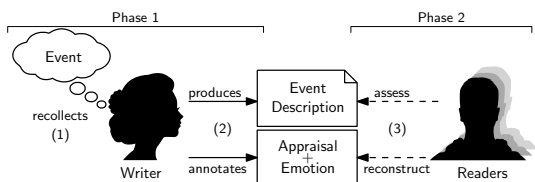
Research questions:

- Do event descriptions contain sufficient information to recover emotion and appraisal values (by models and by humans)?
- Does that reconstruction depend on demographic commonalities between event description authors and readers?
- Does appraisal information improve emotion categorization?

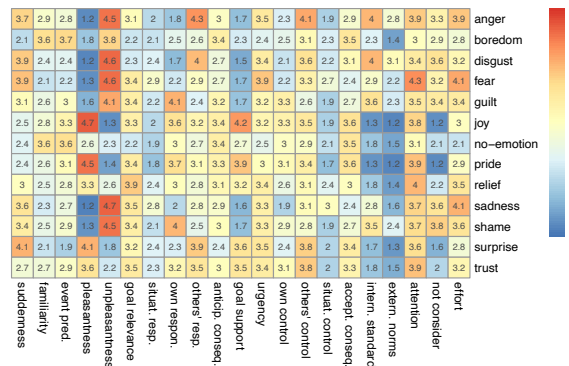
(2) Appraisal Variables

Relevance	Implication	Coping	Normative Significance
Novelty (1) suddenness (2) familiarity (3) predictability (16) attention* (17) att. removal*	Causality: agent (7) own responsibility (8) other's respons. (9) situational respons. Goal conduciveness (10) goal support Outcome probability (11) consequence anticipation Urgency (12) response urgency (Causality: motive) (Expectation discrepancy)	Control (19) own control* (20) others' control* (21) chance control* Adjustment (13) anticipated acceptance (18) effort* (Power)	Internal standards compatibility (14) clash with own standards/ideals External standards compatibility (15) clash with laws/norms

(3) Data Collection



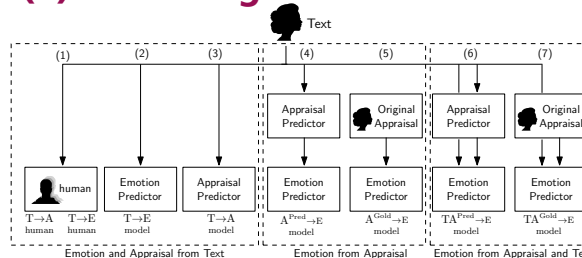
(4) Appraisal-Emotion Relation



(5) Inter-Annotator Agreement

Condition	Val.	#Pairs	Emotion		Appraisal			
			F1	Acc.	RMSE	RMSE		
All Data		6600 12000	.49	.49	*.50	*.52	*1.57	*1.48
Gender match	M-M	631 1113	.50	*.45	.51	*.49	1.55	1.50
	F-F	2405 1377	.49	*.52	.51	*.55	1.57	*1.50
Age diff.	> 7	3089 7991	.49	*.48	.51	*.51	*1.58	1.48
	≤ 7	2076 3939	.49	*.51	.50	*.54	*1.56	1.48

(6) Modeling



(7) Results

Emotion	(a) T→E human			(b) T→E model			(c) TA ^{Gold} →E model			(d) TA ^{Pres} →E model			Δ ^(c) Δ ^(d)			
	P	R	F ₁	P	R	F ₁	Δ _{F1} ^(b)	P	R	F ₁	P	R	F ₁	F ₁	F ₁	
Anger	.50	.66	.57	.57	.52	.53	-.04	.56	.58	.57	+0.04	.56	.58	.57	.00	+0.04
Boredom	.78	.69	.73	.81	.87	.84	+0.11	.83	.84	.83	-.01	.83	.83	.83	.00	-.01
Disgust	.85	.53	.65	.74	.59	.66	+0.01	.70	.63	.66	.00	.70	.63	.66	.00	.00
Fear	.66	.83	.73	.65	.66	.65	-.08	.69	.66	.67	+0.02	.69	.66	.67	.00	+0.02
Guilt	.48	.58	.53	.63	.39	.48	-.05	.64	.54	.58	+0.10	.63	.52	.56	-.02	+0.08
Joy	.41	.62	.49	.53	.40	.45	-.04	.49	.48	.48	+0.03	.49	.46	.47	-.01	+0.02
No-emotion	.72	.21	.33	.66	.50	.55	+0.22	.61	.54	.56	+0.01	.62	.53	.56	.00	+0.01
Pride	.52	.69	.59	.48	.64	.54	-.05	.51	.61	.55	+0.01	.50	.62	.55	.00	+0.01
Relief	.56	.74	.64	.65	.63	.63	-.01	.58	.67	.62	-.01	.58	.68	.62	.00	-.01
Sadness	.54	.76	.63	.52	.68	.59	-.04	.61	.69	.65	+0.06	.59	.69	.63	-.02	+0.04
Shame	.48	.48	.48	.53	.50	.51	+0.03	.55	.47	.50	-.01	.55	.45	.49	-.01	-.02
Surprise	.57	.33	.42	.53	.54	.53	+0.11	.58	.44	.49	-.04	.58	.44	.50	+0.01	-.03
Trust	.95	.36	.52	.73	.75	.74	+0.22	.76	.71	.73	-.01	.76	.70	.72	-.01	-.02
Macro avg.	.62	.58	.56	.62	.59	.59	+0.03	.62	.60	.61	+0.02	.62	.60	.60	-.01	+0.01

(8) Examples

Id	Gold	T→E model	TA ^{Pres} →E model	RMSE Text
1	fear	sadness	fear	1.02 <i>When I found out my mum had cancer</i>
2	pride	surprise	pride	1.04 <i>I got my degree</i>
3	relief	trust	relief	1.04 <i>When my child settled well into school</i>
4	disgust	surprise	disgust	1.08 <i>someone dropped meat on the floor at work and used it.</i>
5	no-e.	boredom	no-e.	1.15 <i>travelling to Cooktown Queensland</i>
6	anger	anger	disgust	1.15 <i>I felt ... when my partner wanted to tell me 3 months later that he had texted his ex-partners.</i>
7	pride	joy	pride	1.26 <i>I bought my car recently</i>
8	shame	guilt	shame	1.27 <i>broke an expensive item in a shop accidentally</i>
9	relief	surprise	relief	1.28 <i>I'm supposed to speak publicly but the event gets cancelled.</i>
10	sadness	surprise	sadness	1.29 <i>I found out that my ex-wife was divorcing me.</i>

(9) Conclusion

- Appraisals are a new, complementary concept for textual emotion analysis
- Readers agree more with each other than with original writers
- Demographics have an effect on agreement
- Appraisals help to predict (some) emotions

