

University of Stuttgart
Institute for
Natural Language Processing

Emotion Analysis

Corpus Creation

Nov 8, 2022

Roman Klinger



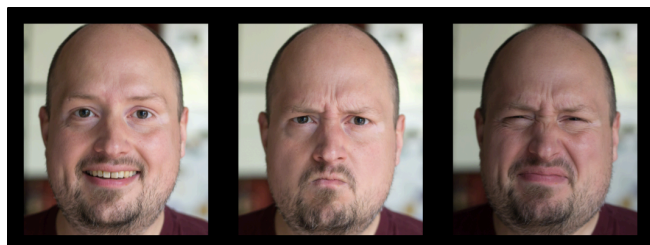
Outline

- 1 Recap
- 2 Need for Annotated Corpora
- 3 Annotation Procedure and Evaluation
- 4 Existing Annotated Corpora for Emotion Analysis
- 5 Assignment 1

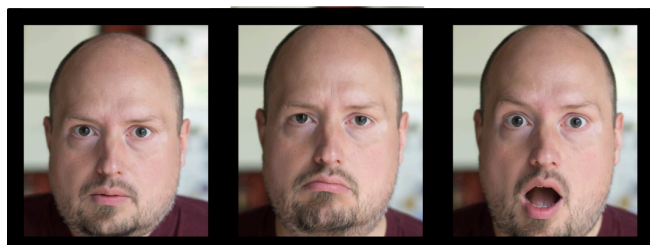
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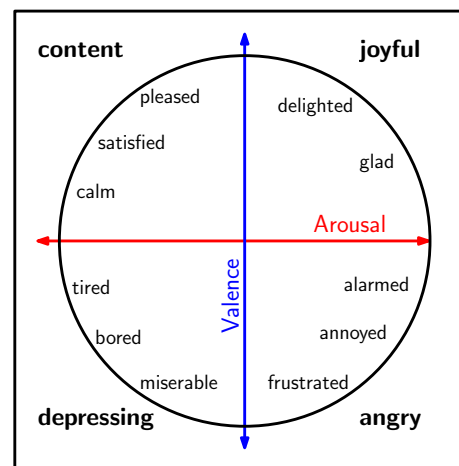
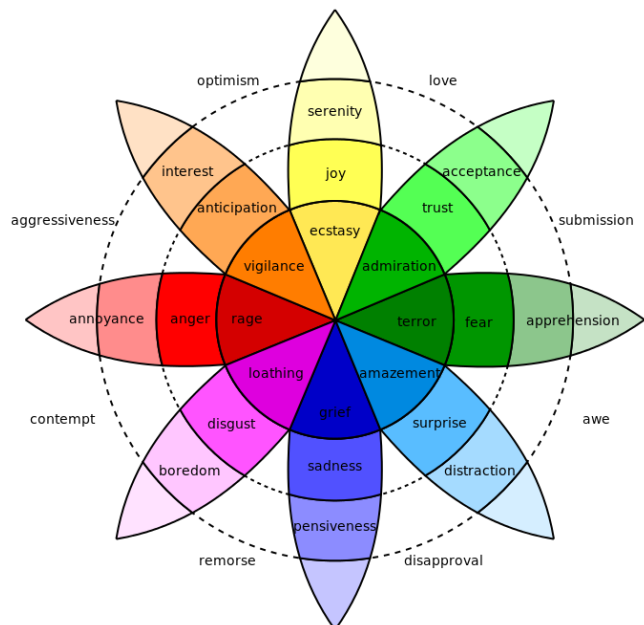
Emotion Models



Joy Anger Disgust



Fear Sadness Surprise



Locations of Emotion Means Along the PCA Components

Emotion	Component					
	Pleasant ^a	Responsibility/Control ^b	Certain ^c	Attention ^d	Effort ^e	Situational-Control ^f
Happiness	-1.46	0.09	-0.46	0.15	-0.33	-0.21
Sadness	0.87	-0.36	0.00	-0.21	-0.14	1.15
Anger	0.85	-0.94	-0.29	0.12	0.53	-0.96
Boredom	0.34	-0.19	-0.35	-1.27	-1.19	0.12
Challenge	-0.37	0.44	-0.01	0.52	1.19	-0.20
Hope	-0.50	0.15	0.46	0.31	-0.18	0.35
Fear	0.44	-0.17	0.73	0.03	0.63	0.59
Interest	-1.05	-0.13	-0.07	0.70	-0.07	0.41
Contempt	0.89	-0.50	-0.12	0.66	-0.07	-0.63
Disgust	0.38	-0.50	-0.39	-0.96	0.06	-0.19
Frustration	0.88	-0.37	-0.08	0.60	0.48	0.22
Surprise	-1.35	-0.94	0.73	0.40	-0.66	0.15
Pride	-1.25	0.81	-0.32	0.02	-0.31	-0.46
Shame	0.73	1.31	0.21	-0.11	0.07	-0.07
Guilt	0.60	1.31	-0.15	-0.36	0.00	-0.29

Note. Scores are standardized.
^a Pleasantness: high scores indicate increased unpleasantness.
^b Responsibility/Control: high scores indicate increased self-responsibility/control.
^c Certainty: high scores indicate increased uncertainty.
^d Attentional activity: high scores indicate increased attentional activity.
^e Effort: high scores indicate increased anticipated effort.
^f Situational control: high scores indicate increased situational control.

Exercise

- Remember an event that caused an emotion in you and describe it with a short text.
- “I walked along the river when I heard a loud sound behind me.”
- Assign values according to the emotion models.
 - **Affect**: Valence, Arousal, Dominance
 - **Components**: Bodily symptoms, action tendencies, expression, subjective perception/feeling
 - **Plutchik**: Protection/Fear, Destruction/Anger, Reproduction/Joy, Deprivation/Sadness, Incorporation/Acceptance, Rejection/Disgust, Exploration/Anticipation, Orientation/Surprise
 - **Ekman**: Joy, Fear, Sadness, Surprise, Anger, Disgust
 - **Appraisal**: pleasantness, control, responsibility, certainty, attention, effort
 - **Regulation**: situation selection, modification, attentional deployment, reappraisal, response modulation
- Think about: What is the relation between these dimensions and the perceived emotion?
- (working in groups is encouraged)

Exercise Discussion: Example 1 from last lecture

Event:

Got paid too much money (a lot!)

- **Affect:** ↑ Valence, ↑ Arousal, ↑ Dominance
- **Components:** Bodily symptoms, action tendencies, expression, subjective perception/feeling
heart beat smile *smile* *soo*
- **Plutchik:** Protection/Fear, Destruction/Anger, Reproduction/Joy, Deprivation/Sadness, Incorporation/Acceptance, Rejection/Disgust, Exploration/Anticipation, Orientation/Surprise
- **Ekman:** Joy, Fear, Sadness, Surprise, Anger, Disgust
- **Appraisal:** pleasantness, ↓ control, ↓ responsibility, ↓ certainty, ↑ attention, ↑ effort
- **Regulation:** situation selection, modification, attentional deployment, reappraisal, resonance modulation

*reappraisal
changes
everything*

Exercise Discussion: Example 2 from last lecture

Event:

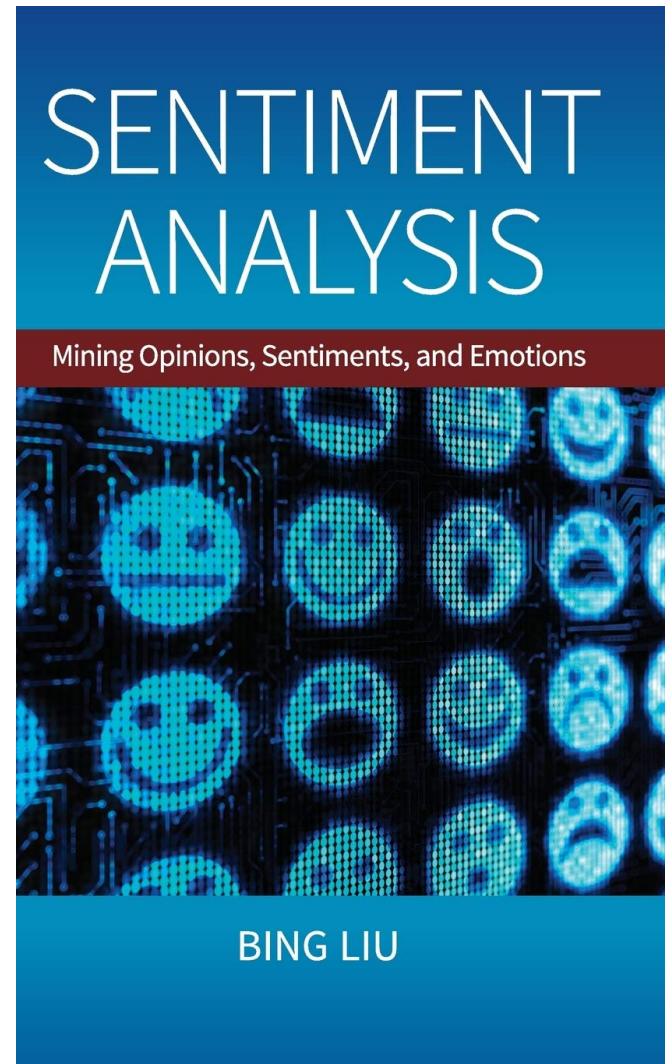
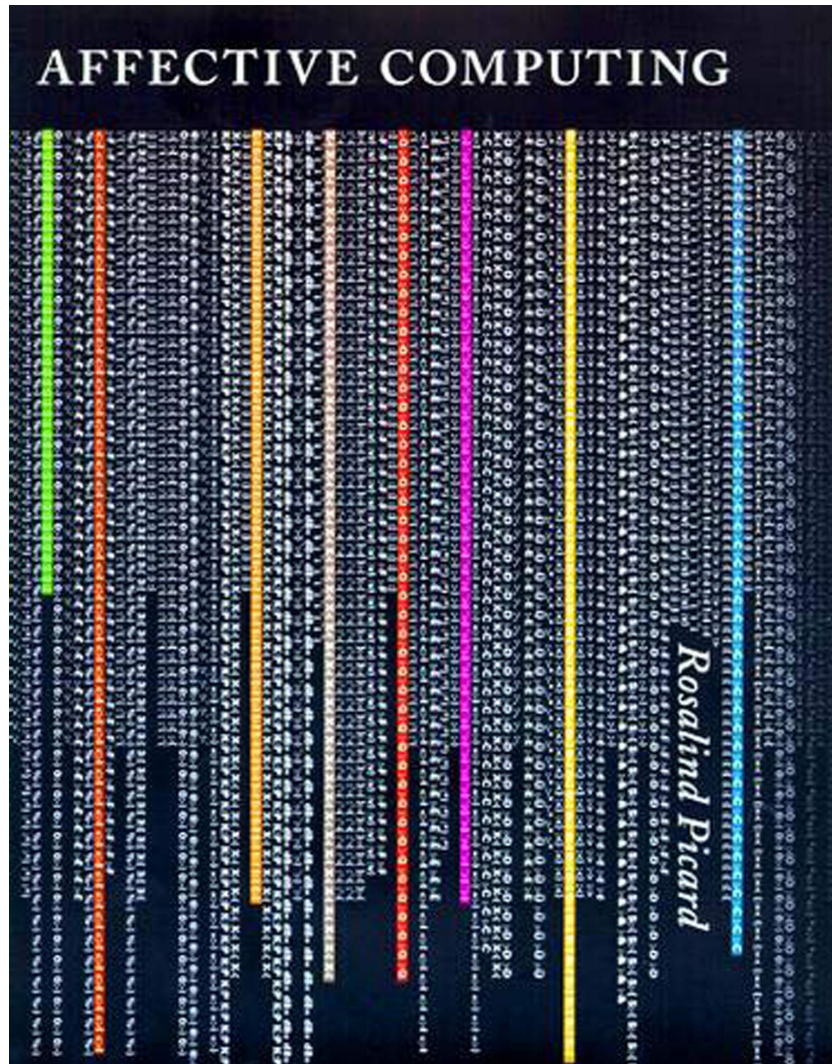
*Navigation system showed wrong long route.
started to walk*

- **Affect:** Valence, Arousal, Dominance
- **Components:** Bodily symptoms, action tendencies, expression, subjective perception/feeling
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Take Away

- Annotation of Corpora in General:
What do we need corpora for?
- Inter-Annotator Agreement:
How can we evaluate the quality of corpora?
(and what can we expect?)
- Examples for Emotion Corpora:
What are use cases and differences?
- Annotation Exercise:
How to create an emotion corpus from scratch?

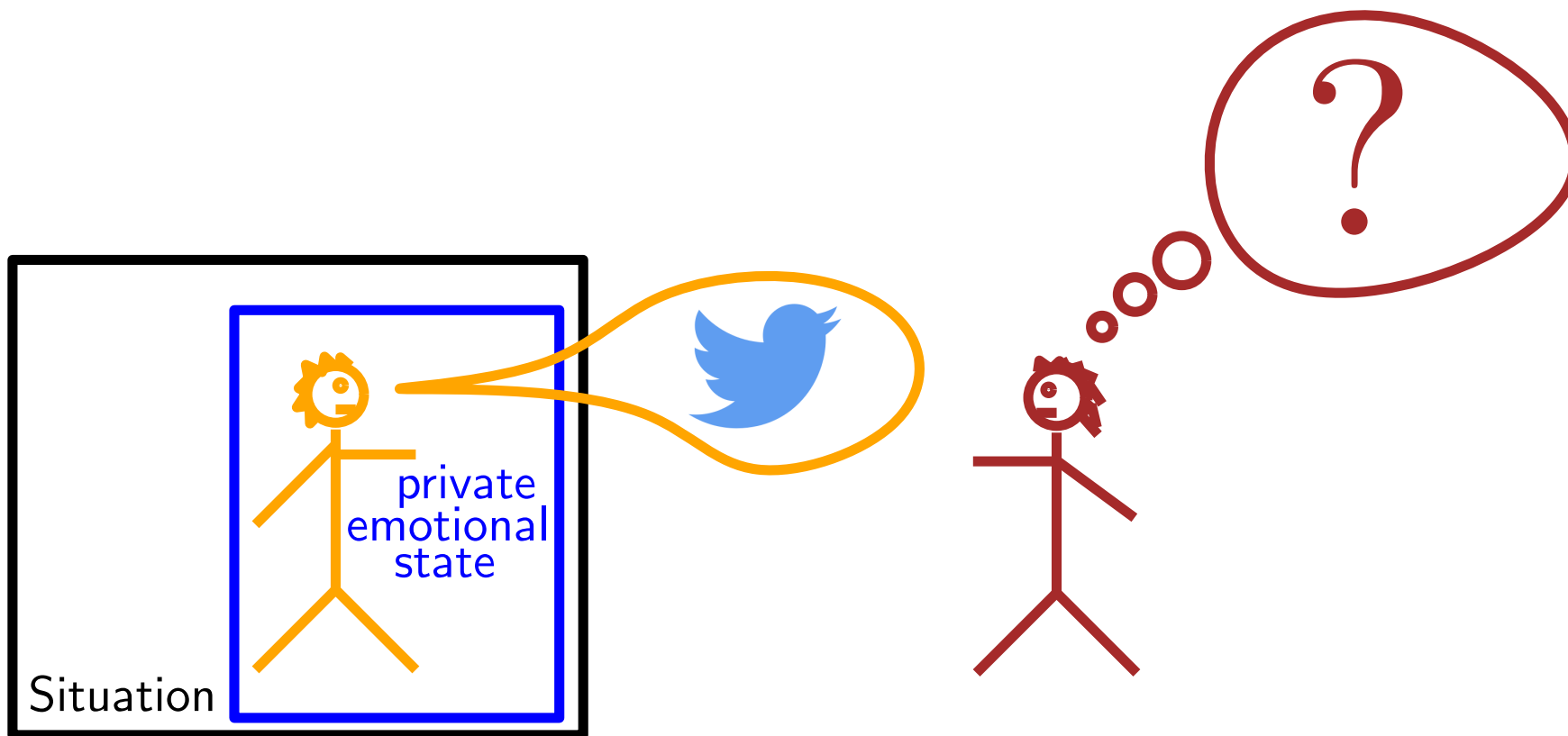
Literature



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From Emotions to Emotion Analysis



Motivation



Roman_Klinger
@Roman_Klinger



Follow

So happy that America is making it possible for ALL of its people to be married to the ones they love! #MarriageEquaility



2:48 PM - 6 May 2015

Which emotions are expressed?

- Anger
- Anticipation
- Disgust
- Fear
- Joy
XXX
- Sadness
- Surprise
- Trust

Motivation



2 Tiny 4 you

@art_eric

Folgen



I'm not angry... just aggressively disappointed.

Which emotions are expressed?

Anger

Anticipation

Disgust

Fear

Joy

Sadness

Surprise

Trust

XXX

Motivation



The Riddling Rhymer
@Dr_Riddle_Rhyme

Folgen



Why criticise religions? If a path is not your own. Don't be pretentious. And get down from your throne. #religion #peace #worldpeace

Original (Englisch) übersetzen

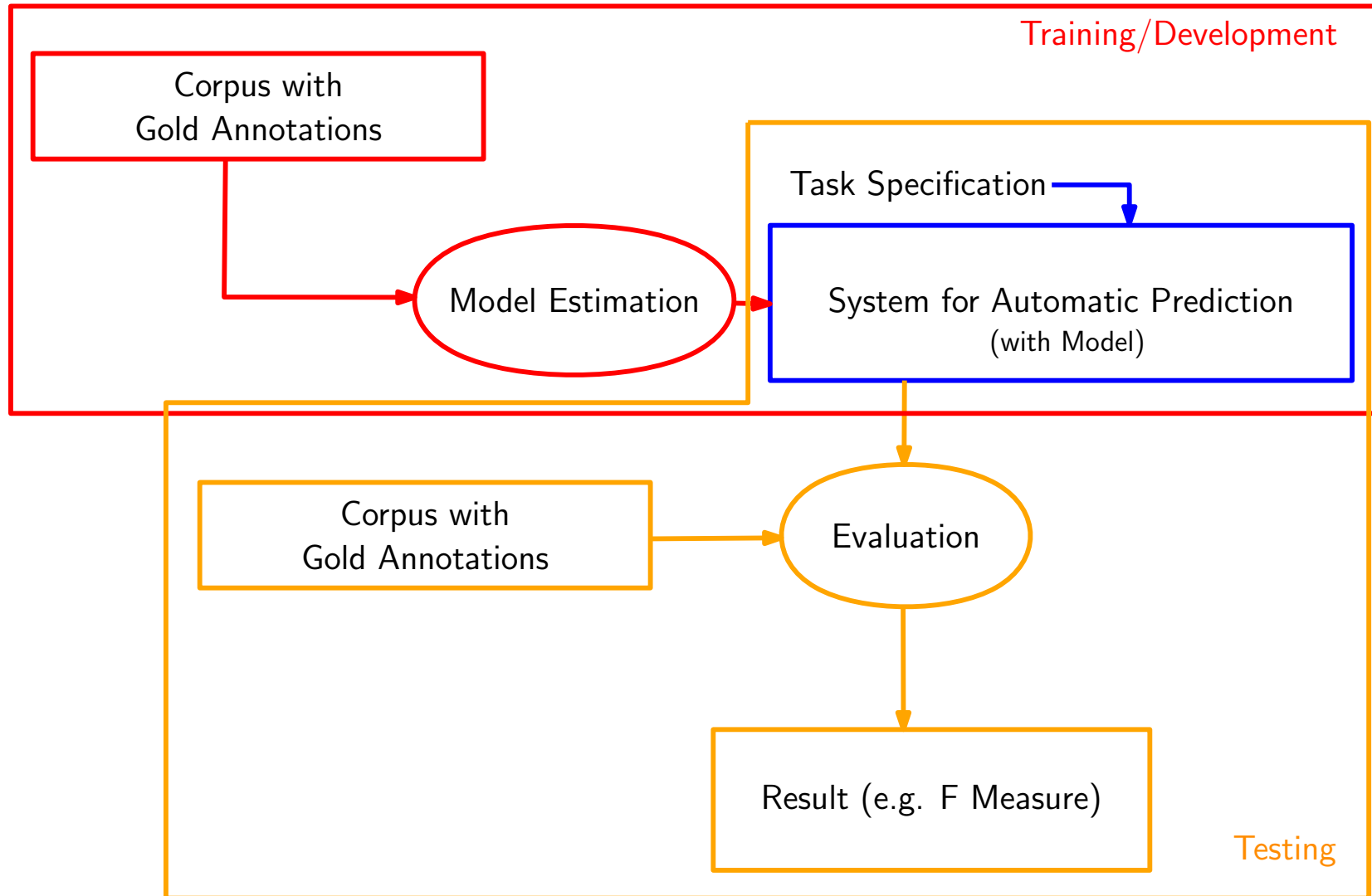
22:11 - 25. Juni 2015



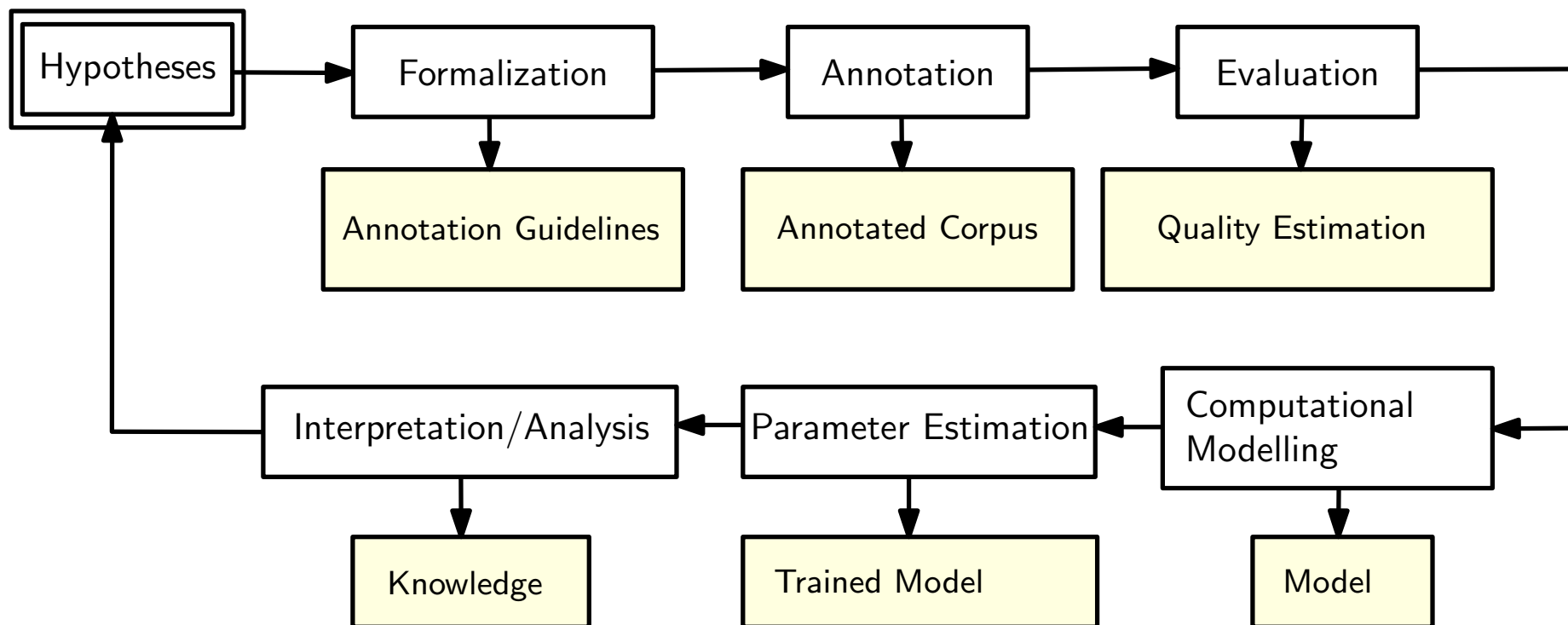
Which emotions are expressed?

Anger	Anticipation	Disgust	Fear	Joy	Sadness	Surprise	Trust
XXXX	XX	X		X	X		X

The Need for Corpora 1: Engineering Perspective



The Need for Corpora 2: Research Perspective



Properties of Corpora

- Representative for what a system should be used for later.
- Train and test instances should be sampled i.i.d: independent and identically distributed
- Annotations should be representative for what the user expects.

Real-world

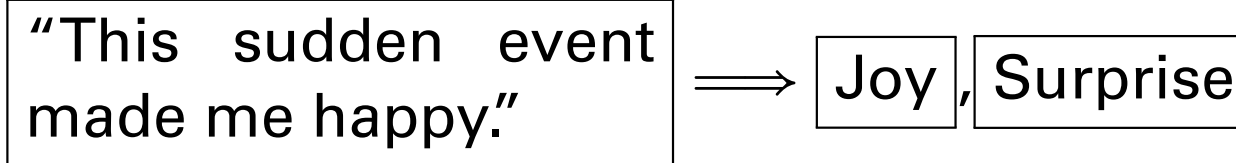
All these assumptions are sometimes (always?) violated.

Examples for Annotations

- Nominal, multi label:

$$f(\text{document}) \rightarrow \mathcal{P}(\{\text{Anger, Fear, Joy, Surprise, Sadness}\})$$

- Example: Multi-label annotation, any set of emotions can hold for one instance.



Examples for Annotations

Annotations can be (for instance)

- Nominal, single label:

$$f(\text{Lorum ipsum dolor sit amet, consectetur adipiscing elit, sed eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation}) \rightarrow \{\text{Anger, Fear, Joy, Surprise, Sadness}\}$$

- Nominal, multi label:

$$f(\text{Lorum ipsum dolor sit amet, consectetur adipiscing elit, sed eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation}) \rightarrow \mathcal{P}(\{\text{Anger, Fear, Joy, Surprise, Sadness}\})$$

- Numeric: $f(\text{Lorum ipsum dolor sit amet, consectetur adipiscing elit, sed eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation}) \rightarrow [0; 1]^n$

- Ordinal: $f(\text{Lorum ipsum dolor sit amet, consectetur adipiscing elit, sed eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation}) \rightarrow \{\text{low-intens, medium-intens, high-intens}\}$

Annotation task specification consists of (at least) two steps

- Deciding the underlying emotion model
- Deciding the actual annotation setup

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Corpus building

- We need annotated corpora!
 - For testing a system
 - For development of a system
- One common procedure:
 - Write annotation guideline
 - Let \geq two annotators annotate a small set of texts
 - Measure inter-annotator agreement
 - If satisfied, let them annotate independently, otherwise improve guidelines, iterate
 - (also common to do a complete corpus annotation with 2 or more annotators to constantly check quality)
- One alternative approach: Crowdsourcing

Crowdsourcing

- Idea:
Ask comparably many people to work on a task without a lot of training.
- Result will be noisy, but aggregating across different people will (hopefully) lead to good result.
- Example platforms:
Amazon Mechanical Turk, Appen (previously known as Figure Eight and Crowdfunder), Prolific...
- One can also use non-dedicated services for that, e.g., Google Forms, SurveyMonkey, Soscisurvey, Google Sheets...

In-house Expert Annotation vs. Crowdsourcing

- **Training**
 - E: Intense, time-consuming
 - C: Nearly none; task formulation needs iterative optimization
- **Quality (for each annotator)**
 - E: Comparably high due to a lot of intense training
 - C: Low, annotators try to cheat, spend little time
- **Quality (altogether)**
 - E: Can be high, if high inter-annotator agreement can be reached
 - C: Can be high, if good strategy for aggregation can be found
- **Costs**
 - E: Expensive
 - C: Cheap if task is easy (practically often not much cheaper)
- **Speed**
 - E: Training takes time, work takes time
 - C: Finding a good task formulation takes looong, once found, data collection is quick.

Annotator Agreement: Categorical Values (1)

Accuracy/Observed Agreement:

- **Categorical values, single-label annotation:**
 - Calculate accuracy between annotators.
for all classes: $\frac{\# \text{ same class}}{\# \text{ all annotations}}$
for each class c_i : $\frac{\# \text{ class } c_i \text{ annotated}}{\# \text{ all annotations}}$
- **Categorical values, multi-label annotation**
 - Calculate accuracy between annotators.
for each class c_i : $\frac{\# \text{ class } c_i \text{ annotated}}{\# \text{ all annotations}}$
- Advantage: Easy to understand, transparent
- Disadvantage: Suffers from imbalanced data, agreement “looks better than it is” (because of skewed distributions)

Annotator Agreement: Categorical Values (2)

- The κ statistic is a measure for several classes, correcting by the chance of agreement!
- $p(A)$: probability of agreement found (=accuracy)
- $p(E)$: agreement expected by chance

$$\kappa = \frac{p(A) - p(E)}{1 - p(E)}$$

where C is the set of classes found and

$$p(E) = \sum_{c \in C} p(c|a_1)p(c|a_2)$$

- Can be used for single-label and multi-label annotations

Annotator Agreement – The κ Statistics

An idea of interpretation (no theoretical foundation!)

κ	Interpretation
< 0	Less than chance
0.01 – 0.20	Slight Agreement
0.21 – 0.40	Fair Agreement
0.41 – 0.60	Moderate Agreement
0.61 – 0.80	Substantial Agreement
0.81 – 0.99	Good Agreement

Annotator Agreement: Continuous Values (1)

Valence/arousal/dominance values or intensities for a particular emotion: Correlation measures

- **Pearson Correlation Coefficient** for paired data

$\{(x_1, y_1), \dots, (x_n, y_n)\}$:

- $$r_{xy} = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2} \sqrt{\sum_{i=1}^n (y_i - \bar{y})^2}}$$
- Assumes Gaussian distribution
- Considers the actual values

- **Spearman Correlation Coefficient** for distances d in ranks of annotations for n instances:

- $$r_s = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)},$$

- No assumption regarding data distribution
- Considers the ranks instead of actual values

How to Annotate for Emotions?

- **Training of annotators can be difficult:**
Writing annotation guideline is difficult, discussion of examples sometimes do not carry over to new examples
- **Agreement between annotators can be low:**
Interpreting emotions is often very subjective
- **Task can be difficult:**
Annotators might diverge from original task

What is the impact of these observations on the annotation setup?
(and agreement calculation)

Perspective of the emotion: Crowdsourcing or Experts?

Consider perspective of the emotion to annotate:

- Which emotion does the annotator experience while reading?
prefer crowdsourcing?
- Which emotion does the writer experience while writing?
prefer crowdsourcing or expert?
- Which emotion would an average reader experience while reading?
prefer crowdsourcing or expert?
- Which emotion does an experiencer mentioned in the text feel?
Expert?

Inter-Annotator Agreement for Subjective Tasks

Emotion annotation is difficult:

- Subjective, might depend on background of annotators
- Some emotions occur more frequently in corpora than others

Impact on inter-annotator agreement:

- Often quite low

Solution (or is that cheating?):

- Report number/fraction of annotators that agree
- Report agreement with adjudicated annotation
(remove outlier annotators before doing calculation)

What agreement scores can we expect?

Emotion Recognition Reliability: Ekman 1972

Experimental Setup

- Photos were taken of people expressing a particular emotion and asked which emotion they feel
- Japanese and US American people were shown these photos and tasked to recover the emotion
- Goal: understand emotion recognition reliability

Results (/)

- .79/.86 acc. between observers
- .57/.62 acc. between subject and observer (.50 baseline)

⇒ Interpretation of emotion might differ from actual emotion.

⇒ **Might that happen in text?**

Factors for emotion recognition reliability

Follow-up studies investigated factors for recognition reliability:

- **Emotion category**
 - Some emotions are easier to recognize than others (joy vs. fear: Mancini 2018)
- **Peer status**
 - Friends are better in recognizing their emotions (Wang 2019)
- **Status of observer**
 - People with depression are more challenged in recognizing emotions (Dalili 2015)
 - Personality traits: conscientious and open people are better to recognize emotions, shy and neurotic people are worse (Hall 2016)

(more in Döllinger 2021)

































- **Does that affect our annotation study design?**

⇒ We might be able to prescreen annotators
(though I have never seen any study doing that in NLP)

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Corpora

Dataset	Type	Annotation	Size	Source	Avail.
AffectiveText		 + {valence}	1,250	Strapparava (2007)	D-U
Blogs		 + {mixed, noemo}	5,025	Aman (2007)	R
CrowdFlower		 + {fun, love, ...}	40,000	Crowdflower (2016)	D-U
DailyDialogs			13,118	Li et al. (2017)	D-R0
Electoral-Tweets			4,058	Mohammad (2015)	D-R0
EmoBank	  		10,548	Buechel (2017)	CC-by4
EmoInt		 - {disgust, surprise}	7,097	Mohammad (2017)	D-R0
Emotion-Stimulus		 + {shame}	2,414	Ghazi et al. (2015)	D-U
fb-valence-arousal			2,895	Preoțiu (2016)	D-U
Grounded-Emotions		  	2,585	Liu et al. (2017)	D-U
ISEAR		 + {shame, guilt}	7,665	Scherer (1997)	GPLv3
Tales			15,302	Alm et al. (2005)	GPLv3
SSEC			4,868	Schuff et al. (2017)	D-R0
TEC		 + {±surprise}	21,051	Mohammad (2012)	D-R0

Bostan/Klinger, COLING 2018

Tales, Alm et al 2005

- **Motivation:** Develop (towards) a system which can read tales to children in appropriate emotional tone.
- **Task:** Annotate emotion felt by a reader/listener
- **Data:** 15000 sentences from 185 fairytales from Potter, Anderson, Grimm
- **Labels:** 6 emotions annotated, angry and disgust merged. Separated positive and negative surprise.
- κ between .24 and .51, depending on annotators.
- **Examples:**
 - (fear) "Quack?" said Jemima Puddle-duck, with her head and her bonnet on the one side—"Quack?"
 - (joy) She rather fancied a tree stump amongst some tall foxgloves.

ISEAR, Scherer et al 1997

- **Motivation:** Understand how events are perceived emotionally (appraisal theory)
- **Data:** 7665 event descriptions (self reports)
- **Labels:** 6 Ekman emotions + shame and guilt
- **Examples:**
 - (fear) When I was involved in a traffic accident.
 - (guilt) When I caused problems for somebody because he could not keep the appointed time and this led to various consequences.
 - (joy) After my girlfriend had taken her exam we went to her parent's place.
- **Similar data:**
 - Klinger et al 2018: Implicit Emotions Shared Task
<http://implicitemotions.wassa2018.com>
 - Troiano et al 2019: Crowdsourced data in German and English
<https://www.ims.uni-stuttgart.de/data/deisear>

Headlines, Strapparava et al 2007

- **Motivation:**
News corpus for shared task on emotion classification
- **Data:** 1250 news headlines
- **Labels:** Ekman (“emotional load” $\in [0; 100]$)

- Inter-annotator agreement measured via correlation

- **Examples:**


- joy,surprise:
United Finds Good Connection in Win
- joy,surprise:
Tom Cruise and Katie Holmes set wedding date
- joy,anger,disgust,fear,surprise:
Hacker unlocks Apple music download protection

EMOTIONS	
Anger	49.55
Disgust	44.51
Fear	63.81
Joy	59.91
Sadness	68.19
Surprise	36.07
VALENCE	
Valence	78.01

Blogs, Aman et al 2007

- **Motivation:** Create general purpose emotion corpus
- **Data:** 5000 sentences from blog posts
- **Labels:** 6 Ekman emotions + neutral + mixed, multi-label
- **Examples:**
 - (sadness, high): I have to look at life in her perspective, and it would break anyone's heart.
 - (surprise, medium): We stayed in a tiny mountain village called Droushia, and these people brought hospitality to incredible new heights.
 - (fear, low): Which, to be honest, was making Brad slightly nervous.

Blogs, Aman et al 2007



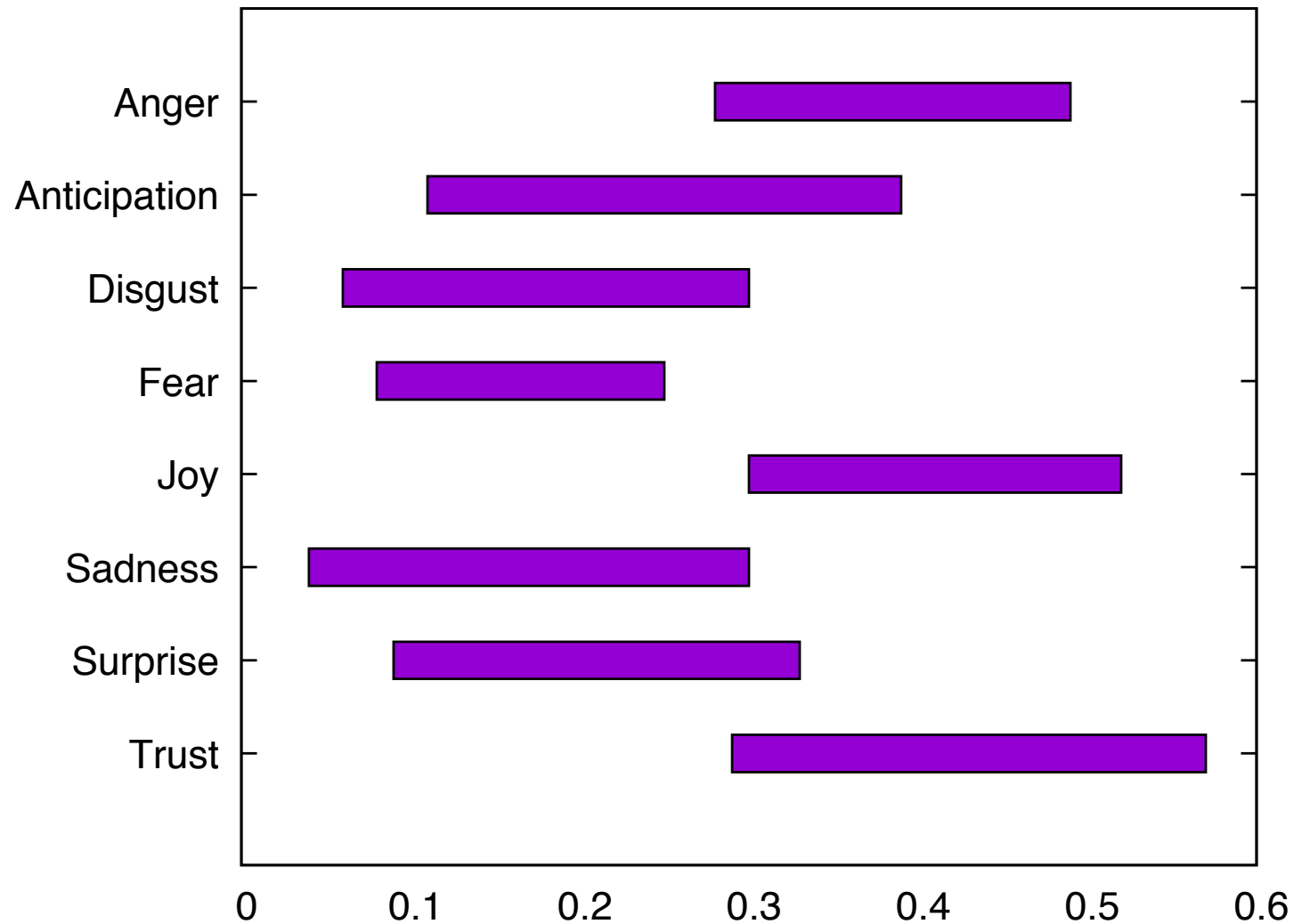
Category	a↔b	a↔c	a↔d	average
happiness	0.76	0.84	0.71	0.77
sadness	0.68	0.79	0.56	0.68
anger	0.62	0.76	0.59	0.66
disgust	0.64	0.62	0.74	0.67
surprise	0.61	0.72	0.48	0.60
fear	0.78	0.80	0.78	0.79
mixed emotion	0.24	0.61	0.44	0.43

SSEC, Schuff et al 2018

- **Motivation:** Generate publicly available tweet emotion corpus with multiple labels for each instance
- **Task:** Annotate emotion of author of tweets
- **Data:** 4870 Tweets with preexisting annotation of sentiment and stance (SemEval 2016)
- **Labels:** 8 Plutchik emotions
- **Procedure:** 7 annotators, students of Media Informatics

SSEC: Inter-annotator Agreement

Range of pairwise agreement between all annotation pairs



SSEC: Cooccurrences of Labels

	Emotions							Sentiment			Stance			
	Anger	Anticipation	Disgust	Fear	Joy	Sadness	Surprise	Trust	Positive	Negative	Neutral	In Favor	Against	None
Anger	2902	1437	1983	1339	774	2065	711	640	275	2534	93	630	1628	644
Anticipation		2700	1016	1029	1330	1369	482	1234	1094	1445	161	772	1291	637
Disgust			2183	1024	512	1628	526	404	126	2008	49	429	1291	463
Fear				1840	466	1445	407	497	306	1445	89	448	982	410
Joy					2067	682	438	1101	1206	750	111	596	952	519
Sadness						2644	664	613	345	2171	128	604	1429	611
Surprise							1108	222	219	801	88	257	521	330
Trust								1713	1082	558	73	500	860	353
Positive									1524	0	0	485	673	366
Negative										3032	0	622	1665	745
Neutral											312	97	71	144
In Favor												1204	0	0
Against													2409	0
None														1255



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- Many cooccurrences as expected (pos w/ pos, neg w/ neg)

SSEC: Cooccurrences of Labels

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None														1255

- Positive Anger

SSEC: Cooccurrences of Labels

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	Anger	Anticipation	Disgust	Fear	Joy	Sadness	Surprise	Trust	Positive	Negative	Neutral	In Favor	Against	None
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Neutral											312	97	71	144
In Favor												1204	0	0
Against													2409	0
None														1255

- Negative Joy

SSEC: Cooccurrences of Labels

	Emotions								Sentiment			Stance		
	Anger	Anticipation	Disgust	Fear	Joy	Sadness	Surprise	Trust	Positive	Negative	Neutral	In Favor	Against	None
Anger	2902	1437	1983	1339	774	2065	711	640	275	2534	93	630	1628	644
Anticipation		2700	1016	1029	1330	1369	482	1234	1094	1445	161	772	1291	637
Disgust			2183	1024	512	1628	526	404	126	2008	49	429	1291	463
Fear				1840	466	1445	407	497	306	1445	89	448	982	410
Joy					2067	682	438	1101	1206	750	111	596	952	519
Sadness						2644	664	613	345	2171	128	604	1429	611
Surprise							1108	222	219	801	88	257	521	330
Trust								1713	1082	558	73	500	860	353
Positive									1524	0	0	485	673	366
Negative										3032	0	622	1665	745
Neutral											312	97	71	144
In Favor												1204	0	0
Against													2409	0
None														1255

- Positive Disgust

SSEC: Examples

Positive Anger

“Lets take back our country! Whos with me? No more Democrats!2016”

“Why criticise religions? If a path is not your own. Don’t be pretentious. And get down from your throne.”

Negative Joy

“Global Warming! Global Warming! Global Warming! Oh wait, it’s summer.”

“I love the smell of Hillary in the morning. It smells like Republican Victory.”

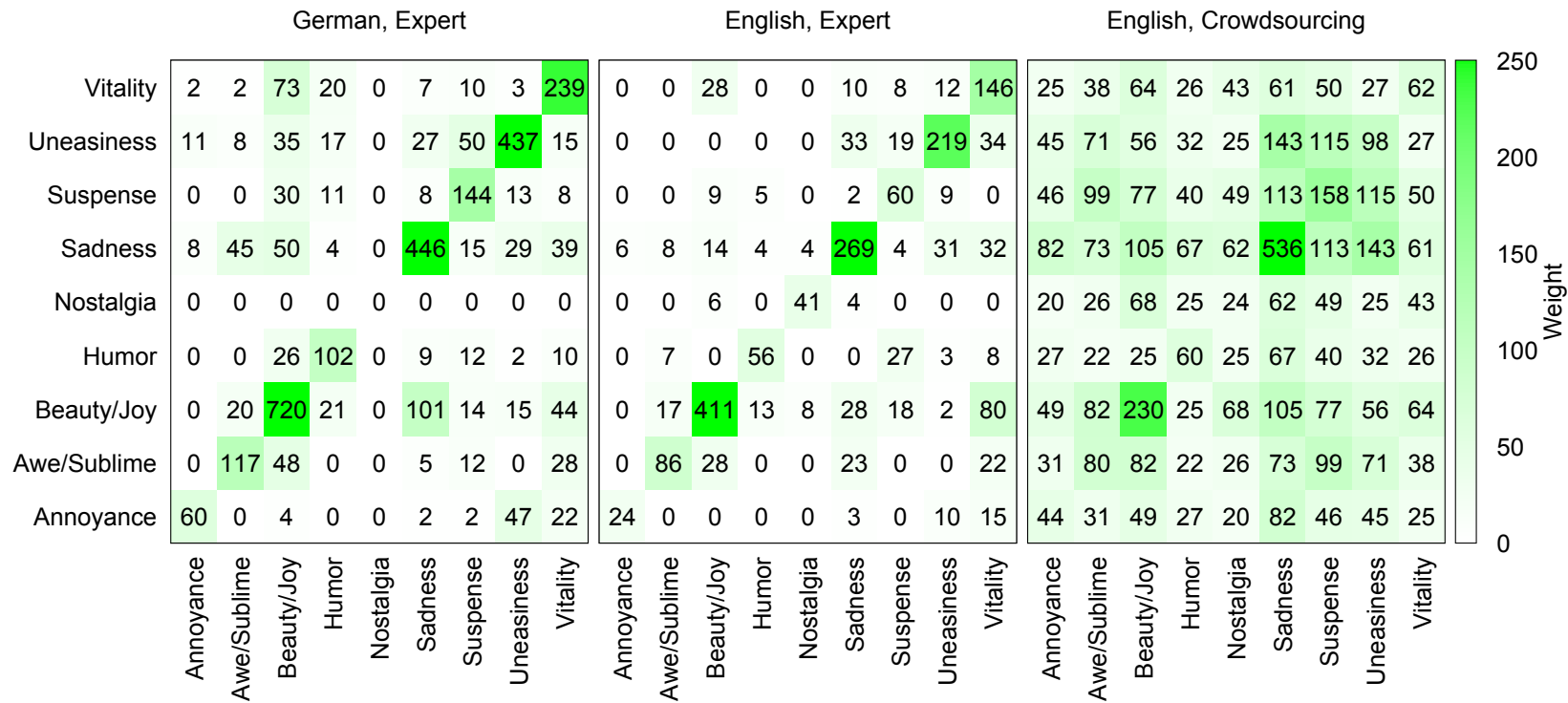
Positive Disgust

“#WeNeedFeminism because #NoMeansNo it doesnt mean yes, it doesnt mean try harder!”

PO-EMO, Haider et al 2020

- **Motivation:** Analyze emotions expressed in poetry, also in relation with stylistic characteristics
- **Data:** 158 German and 64 English poems
- **Labels:** Aesthetic emotions: Beauty/Joy, Sadness, Uneasiness, Vitality, Awe/Sublime, Suspense, Humor, Nostalgia, Annoyance

PO-EMO, Inter-Annotator Agreement



PO-EMO, Examples (1)

Friedrich Hölderlin: Hälfte des Lebens (1804)

Mit gelben Birnen hänget	[Beauty/Joy]
Und voll mit wilden Rosen	[Beauty/Joy]
Das Land in den See,	[Beauty/Joy]
Ihr holden Schwäne,	[Beauty/Joy]
Und trunken von Küssen	[Beauty/Joy]
Tunkt ihr das Haupt	[Beauty/Joy]
Ins heilignüchterne Wasser.	[Beauty/Joy]

Weh mir, wo nehm' ich, wenn	[Sadness]
Es Winter ist, die Blumen, und wo	[Sadness]
Den Sonnenschein,	[Sadness]
Und Schatten der Erde?	[Sadness]
Die Mauern stehn	[Sadness]
Sprachlos und kalt, im Winde	[Sadness]
Klirren die Fahnen.	[Sadness]

PO-EMO, Examples (2)

Walt Whitman: O Captain! My Captain! (1865)

O Captain! my Captain! our fearful trip is done,	[Beauty/Joy]
The ship has weather'd every rack, the prize we sought is won,	[Beauty/Joy]
The port is near, the bells I hear, the people all exulting,	[Beauty/Joy]
While follow eyes the steady keel, the vessel grim and daring;	[Beauty/Joy]
But O heart! heart! heart!	[Sadness]
O the bleeding drops of red,	[Sadness]
Where on the deck my Captain lies,	[Sadness]
Fallen cold and dead.	[Sadness]
O Captain! my Captain! rise up and hear the bells;	[Vitality]
Rise up – for you the flag is flung – for you the bugle trills,	[Vitality]
For you bouquets and ribbon'd wreaths –	
for you the shores a-crowding,	[Vitality]
For you they call, the swaying mass, their eager faces turning;	[Vitality]
Here Captain! dear father!	[Vitality]
This arm beneath your head!	[Vitality]
It is some dream that on the deck,	[Sadness]
You've fallen cold and dead.	[Sadness]
My Captain does not answer, his lips are pale and still,	[Sadness]
My father does not feel my arm, he has no pulse nor will,	[Sadness]
The ship is anchor'd safe and sound, its voyage closed and done,	[Vitality] [Sadn.]
From fearful trip the victor ship comes in with object won;	[Vitality] [Sadn.]
Exult O shores, and ring O bells!	[Vitality] [Sadn.]
But I with mournful tread,	[Sadness]
Walk the deck my Captain lies,	[Sadness]
Fallen cold and dead.	[Sadness]

PO-EMO, Examples (3)

Georg Trakl: In den Nachmittag geflüstert (1912)

Sonne, herbstlich dünn und zag, [Beauty/Joy] [Nostalgia]
Und das Obst fällt von den Bäumen. [Beauty/Joy] [Nostalgia]
Stille wohnt in blauen Räumen [Beauty/Joy]
Einen langen Nachmittag. [Beauty/Joy]

Sterbeklänge von Metall; [Sadness] [Uneasiness]
Und ein weißes Tier bricht nieder. [Sadness] [Uneasiness]
Brauner Mädchen rauhe Lieder [Sadness] [Nostalgia]
Sind verweht im Blätterfall. [Sadness] [Nostalgia]

Stirne Gottes Farben träumt, [Uneasiness] [Awe/Sublime]
Spürt des Wahnsinns sanfte Flügel. [Uneasiness] [Awe/Sublime]
Schatten drehen sich am Hügel [Uneasiness] [Awe/Sublime]
Von Verwesung schwarz umsäumt. [Uneasiness] [Awe/Sublime]

Dämmerung voll Ruh und Wein; [Beauty/Joy]
Traurige Gitarren rinnen. [Beauty/Joy]
Und zur milden Lampe drinnen [Beauty/Joy]
Kehrst du wie im Traume ein. [Beauty/Joy]

EmoBank, Buechel/Hahn 2017

- **Motivation:** Study the difference between writer's and reader's emotion
- **Data:** Balanced across genres, taken from the American National Corpus and SemEval 2007, 10k sentences
- **Labels:** Valence, Arousal, Dominance
- **Examples:**
 - (3.27 3.36 3.36): "I've got more than a job; I've got a career."
 - (1.2 4.2 3.8): "Fuck you"
 - (4.4 4.1 3.8): "Tell her I love her."
 - (1.9 3.8 2.0): "Hands closed on my neck and I felt my spine crack."
- **IAA:** Reader perspective: $r = .61$, Writer perspective: $r = .63$

Crowd-enVENT, Troiano 2023

- **Motivation:** Study the emotion recognition reliability for emotions and appraisals in event descriptions
- **Data:** Event Descriptions, 6600 instances, 1200 annotated by external readers
- **Labels:** 12 Emotions + neural, 22 Appraisals
- **Examples:**
 - fear: "I was running away from a shooting and a car was trying to run me down"
 - pride: "when I ran a marathon at a decent pace and finished the race in a good place"
 - disgust: "His toenails where massive"
- IAA for emotions: .52 acc between readers; with writer: .50
- IAA for appraisals (RMSE):
1.48 between readers; with writer: 1.57

We will see more resources later in the context of other topics.

Take Away

- Annotation of Corpora in General:
What do we need corpora for?
- Inter-Annotator Agreement:
How can we evaluate the quality of corpora?
(and what can we expect?)
- Examples for Emotion Corpora:
What are use cases and differences?
- Annotation Exercise:
How to create an emotion corpus from scratch?

Outline

- 1 Recap
- 2 Need for Annotated Corpora
- 3 Annotation Procedure and Evaluation
- 4 Existing Annotated Corpora for Emotion Analysis
- 5 Assignment 1

Schedule

Time Plan Emotion Analysis WS 2022/2023

Publication/ Session Date	No	Lecture	Exercise Sheet Publication
18.10.2022	1	Emotion Models 1, Introduction	
25.10.2022	2	Emotion Models 2	
08.11.2022	3	Corpus Creation	Corpus Creation Exercise
15.11.2022	4	Dictionary-based Systems	
22.11.2022	5	Corpus Creation Exercise Discussion	
29.11.2022	6	Evaluation-based Approaches	
06.12.2022	7	ML-based Emotion Classification	ML-based emotion classification Exercise
13.12.2022	8	Intensity Prediction and VAD	
20.12.2022	9	ML-based emotion classification Exercise Discussion	Literature Review Exercise
10.01.2023	10	Stimulus Detection and Role Labeling	Stimulus Detection Exercise
17.01.2023	11	Literature Review Exercise Discussion	
24.01.2023	12	Lecture; topic tbd	
31.01.2023	13	Stimulus Detection Exercise Discussion	
07.02.2023	14	EXAM	

Annotation Exercise, Assignment 1

Develop an own (small) emotion corpus in a domain of your interest.

- The following task description is available online/Ilias.
- We propose that you work in groups, at least of two people.
- If that is not possible, you could do two timely distant annotation rounds to calculate intra-annotator agreement.

Goal

Learn and practice how to create an emotion corpus from scratch. Reflect on design choices in the process.

Annotation Exercise, Assignment 1

Step 1: Task Definition

- Decide on a data source and language
(Tweets, SMS, emails, news headline, Reddit posts, ...)
- Define task
(author's emotion/your perception, label set/values)

Step 2: Prepare Annotation Environment

- Subsample (at least) 50 instances (more is better)
- Put them into a copy of an annotation environment which I prepared.
(you can also use a different environment if you prefer)

Annotation Exercise

Step 3: Annotation Guidelines

- Annotate ten instances together, write annotation guidelines (briefly, focus on task and how to decide on emotion class)

Step 4: Annotate

- Make copy of annotation environment for each team member
- Annotate all remaining instances

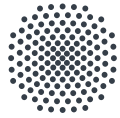
Step 5: Analysis

- Prepare corpus statistics and agreement scores
- Analyze difficult cases qualitatively

Annotation Exercise

Step 6: Make slides for presentation

- Report data source, selection procedure, motivate your design decisions
 - Show examples, report statistics (class cooccurrences, frequencies, mutual information with particular words, ...)
 - Discuss annotation difficulties, **be creative and critical** (in 5–10 minutes)
-
- Submit slides via Ilias (in PDF format, mandatory)
 - If you would like to provide additional information: add another document (optional)
 - Indicate in table on Ilias if you want to present
 - Be prepared to present anyway



University of Stuttgart
Institute for
Natural Language Processing

Emotion Analysis

Corpus Creation

Nov 8, 2022

Roman Klinger

