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**Identifying speech acts in emails:
Business English and non-native
speakers**

Rachele De Felice
RDefelice@ets.org
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The general idea

From this –

I am so happy you asked me. I will go to the meeting. Could you please tell me what papers I should bring?

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 **The general idea** Listening, Learning, Leading.®


To this –

I am so happy you asked me.
#DD – expression of feelings

I will go to the meeting.
#DE – commitment


Could you please tell me what papers I should bring?
#QA – request in the form of a question

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 **The data** Listening, Learning, Leading.®

- L2 English test – non-academic purposes
- Adult test takers, mostly East Asian
- Writing test includes the ‘email’ task:
Prompt email followed by directions
Correct answer requires use of particular speech acts
- Our set: 1160 texts, over 13k utterances

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- Why should we do this?
- How can we do this?
- What can we learn from this?

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Why should we do this?

- To develop tools for the automatic scoring of texts
- To further research on email data
 - Understanding message content
 - Analysing its style and language
- To gain insights into the language used by L2 English students

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 **How do we do this?** Listening, Learning, Leading.®

Annotate each utterance with a speech act label


- AA – request
Please tell me what to do.
- DD – disclosure of feelings (1st person)
I am happy about this decision.
- DE – commitment or conveying of facts (1st person)
I will be there tomorrow.
- QA – request in the form of a question
Can you tell me where she is?
- QQ – plain question
Is the office open on Saturday?
- OT – Third person or other statements
This decision makes me happy.
My phone number is 123-456-789.
You seem very busy.

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 **How do we do this?** Listening, Learning, Leading.®

- Break down speech acts into representative features
- Different bundles of features = different type of sp. a.

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How do we do this?

- Break down speech acts into representative features
- Different bundles of features = different type of sp. a.

- Combination of data-driven and theory-driven

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Feature set

- Punctuation
- Length
- Subject type
- Subject item
- Object type
- Object item
- Presence of modal
- Modal item
- Sentence type
- Presence of predicative adjective
- Presence of named entity
- Verb type
- Verb tag
- Complex structures
- Presence of wh-words
- First word
- Last word
- Bigrams

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Example (1)

- I am so happy about this. [DD]
- Punct: .
- Length: 7
- Subject: pronoun, 'I'
- Sentence type: declarative
- Predicative adjective: yes, 'happy'
- Verb tag: VBP
- First word: 'I'
- Last word: 'this'

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Example (2)

- Of course I can help you. [DE]
- Object: pronoun, 'you'
- Modal: yes, 'can'
- Sentence type: declarative
- Verb type : bare infinitive (S[b])
- Complex structure: I + modal + infinitive
- Bigrams: 'I can'

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Feature extraction

- Features are obtained using C&C parser
 - POS tagger, CCG dep. parser, named entity recogniser
- Get info about subjects, objects, verb phrases, adjective modification, etc
 - Also labels verb types (imperatives, passives, gerunds...)
 - And sentence types (declaratives, wh-questions, y/n questions, embedded...)
- Bigram list compiled from tests and Enron data

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Training a classifier

- Train a maxent classifier to associate different combinations of features with different classes
- Best result to date: 80% accuracy...
(79% recall, 81% precision)

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Results

	Tot	Recall	Precision
AA	143	81.12%	84.67%
DD	159	74.21%	69.00%
DE	304	80.59%	80.85%
QA	65	70.77%	76.85%
QQ	151	83.44%	88.46%
OT	108	86.11%	86.30%
av	930	79.37%	81.02%

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Results

	AA	DD	DE	OT	QA	QQ
AA	116	7	11	8	1	--
DD	2	118	34	4	--	1
DE	10	37	245	10	--	2
OT	3	2	8	93	--	2
QA	2	1	1	--	46	15
QQ	4	6	4	6	5	126

(row = reference; col = test)

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For comparison

- Baseline:
 - First word only – 53%
 - Last word only – 42%
 - First + last word – 60%
 - Punctuation – 43%
- Novel data:
 - Enron emails: 62%
 - Different test prompt: up to 80%
- Similar work: high 70s

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What can we learn?

- Learners and speech acts:
 - How do they use them?
 - Are some easier than others?
- How does this compare to L1 data?
 - Are appropriate models being learnt?

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Next steps

- Analyze contribution of each feature
- Error analysis
- Other aspects of the text: grammar/lexical errors, off-topicality

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AA	1426
DD	1588
DE	3037
ED	116
EE	590
OO	368
QA	654
QQ	1505
Tot.	9284

-- EE, ED, OO combined into one 'Other' class --

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Individual features

- Still looking at the effect of individual features, first findings tell us that –
 - Adding first & last word → +2%
 - Adding bigrams → +2%
 - Still trying to understand best use of bigrams
 - Unigrams also to be included

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