Making Sense of Information Overload in a Digital Age:
Language & Identity

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Got too many ways to communicate?
Why this is a good thing...for computers

Computers can handle the details of large quantities of data.

Computers can learn interesting things if there’s enough data.

Linguistic Data Consortium
The Linguistic Data Consortium supports language-related education, research and technology development by creating and sharing linguistic resources: data, tools and standards.
What we can learn about

We all have our own way of communicating

Use non-verbal cues like voice pitch, eye gaze, and gesture (telephone, skype, in-person)

Use verbal cues
(text messages, email, twitter, blogs)

Verbal cues can be very distinctive.

Idea: We each have a “writeprint” (Iqbal et al. 2010) that captures our particular style.
So what’s in a writeprint?

Some example **stylometric** and **content** features:

- punctuation (ex: ?, !, .)
- capitalization patterns (ex: i vs. I)
- self-reference (ex: me vs. you)
- lexical diversity (ex: lots of the same words)
- verbosity (ex: average sentence length, average word length)
- distinct synonym usage (ex: daddy vs. dad vs. papa vs. father)
- topics (ex: relationships vs. emails vs. sports)
The use of writeprints

Email identity theft: Who really wrote this?

Someone has gained access to your email address and contacts, locking you out of your account and sending messages as if they were you.

How could someone tell that the false emailer isn’t really you?

Does the writeprint of the more recent messages match your writeprint?
The use of writeprints

Writeprints in action for authorship deception
(Pearl & Steyvers, in prep)

Detecting imitation attacks where people attempted to imitate the writing of a particular author

100% detection, often using just a few features.
The use of writeprints

Authorship attribution: Who really wrote this?
Someone has anonymously posted a vitriolic entry on a public forum.

How could someone tell who wrote the entry?

Whose writeprint does the entry match?
The use of writeprints

Writeprints in action for authorship attribution
(Pearl & Steyvers, in prep)

Detecting whether a blog entry of unknown authorship was written by a given author.

81% attribution accuracy, using a mix of content and stylometric features.

Example content feature
Topic key words:
game, team, games, play, win, poker, casino

Most likely authors:
andykelly 0.086
LouDiFalco 0.036
poker_star 0.035
ben 0.024
TheOminpotentQ 0.021
gamblingnet 0.021
OMmetsfan07 0.018

...had a rockin’ win last night...
...poker’s definitely my game...
...the games that are the best...

home_cookin poker_star
Writeprints: Detecting social cues

You may infer certain information if someone changes their writeprint.

Text message example:
You’re in a rush, so when your friend texts you asking you to meet her later on, you text back a quick “Sure”. She fires back a text asking if you’re mad at her.

What happened?
Friend’s inference: Terse message = angry
Writeprints: Detecting social cues

What if email & text software came with a tone-checker?

To develop this software, we need lots of data about the intended tone of a message.

Idea: Looking for the writeprint of emotions like anger and embarrassment, attitudes like confidence and disbelief, and intentions like persuasion or deception.
Using a game-with-a-purpose

Word Sleuth
Test your social language intelligence

http://gwap.ss.uci.edu

A game-with-a-purpose (GWAP) (Pearl & Steyvers 2010)
– encourages people to generate messages with a specific tone
– evaluates how these messages are perceived by others
Write a message that more clearly expresses 
embarrassment than any other tag.
You are playing on hard difficulty. You will earn 3x the base number of points when people guess correctly. Additionally, you will earn 10 points just for creating!

Write a message that more clearly expresses **embarrassment** than any other tag.

All tags: confidence, deception, disbelief, embarrassment, formality, persuading, politeness, rudeness

Don't use any of these taboo words: embarrassed, embarrassment, embarrass, turning, slipped, wet, aww, tripped, conscious, mint

Please write quality messages. Items judged as bad may be removed; if so, points will be taken away. :(

My message is complete!

Click to Skip
Your message expressing embarrassment was:
Ugh, what's that smell? Oh no...I think you need to change your shirt...I'm really sorry about that...they don't usually overflow their diapers this fast...

Check back in later to see if other players could guess what you were trying to express with this message! If they could, your expressive score will increase.

Play with same settings

Change play settings
Word Sleuth
Test your social language intelligence

Current score for lisa_test1
Expressive: 415  Receptive: 630  E-IQ: N/A  R-IQ: 80  Activity Points: 253

Figure out what this message is trying to express:
Hey did you want to dance? I’m really good at it.

You are guessing a medium sentence. You will earn 2x the base number of points.

- being deceptive
- politeness
- embarrassment
- persuading
- formality
- rudeness
- confidence
- disbelief

I made my choice!
Click to Skip
Word Sleuth
Test your social language intelligence

Current score for lisa_test1
Expressive: 415  Receptive: 660  E-IQ: N/A  R-IQ: 80  Activity Points: 254

You guessed confidence, and the correct answer is confidence.
The message was: Hey did you want to dance? I'm really good at it.

Your guess was correct.

When you correctly identify what a message is trying to express, your receptive score will increase!

Click here to flag this sentence.

Play with same settings
Change play settings
The writeprint of social cues: Some examples

deception: - less use of 1st person pronouns like “me” and “my”
- more use of phrases like “of course” and “actually”
persuasion: - phrases like “have to” and “you should”
rudeness: - negative words like “ugly”, “annoying”, and “mean”
politeness: - words and phrases like “please”, “so sorry”, and “would you like”
formality: - less use of exclamation points and contractions like “don’t”
disbelief: - more question marks and words like “never” and “no way”
confidence: - more use of “I know”, “I believe”, and “positive”
embarrassment: - more use of “can’t believe” and “oh”
Writeprints: Where we can go

Who really wrote this?

→ Protect against email identity theft
→ Help recover authorship information

What did they really mean?

→ tone-checker
→ understand human perception of social cues
→ help diagnose and train people who have difficulty detecting social cues in messages