You should hate this movie!
Detecting concealed attitudes of online persuaders

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Detecting concealed attitudes

There is considerable evidence that people hold implicit attitudes that may conflict with their explicit or expressed beliefs and influence their actions in measurable ways. **We ask whether these tells are infused into measurements of typewritten language production when people are engaged in the act of persuasion.**

Across three experiments (N = 900), we had participants choose topics they held an attitude towards (e.g., movies they had seen and liked/disliked) and had them write opinions that were congruent or incongruent with their attitude.

WRITING TASK

TRUE ATTITUDE	POSITIVE	NEGATIVE
POSITIVE	[Guardians of the Galaxy] This movie has it all: hot main actor (Chris Pratt), hilarious comedy, action, explosions, etc… Not to mention great action by everyone. It's like Star Wars on steroids. The visual aspects of this movie are spectacular! The story line is superb. And the comedy will have you rolling in the eyes **Congruent**	[Titanic] It's like every other Titanic movie out there. We all know the ship goes down anyway. Plus, the acting is just so so. I hate that they used fictional people as the main characters. It would have been better if they used an actual couple instead. I suggest you not see this movie **Incongruent**
NEGATIVE	[Paul Blart: Mall Cop] If you just want to laugh at silly stuff, I would recommend you go see this movie. Kevin James is one of my favorite comedy actors and he is hilarious in this part. He is a caring, sometimes over-protective, dad to his young daughter, who he is trying his best to raise by himself. It is surprising to see all the stunts he actually can do, too **Incongruent**	[Company Man] This is the only movie in my life that I ever walked out of and demanded to get my money back. It's THAT bad! It was out some 15 or so years ago, so I can't even remember the story line. I just remember it being ridiculous and the acting was so bad **Congruent**

Creating a cognitive-behavioral feature space

The question of interest is whether we can detect concealed attitudes. However, the data contains many different kinds of features that could be included in the model.

As entry-point, we have opted to keep the feature sets as simple as possible. Similarly, we will compare performance for semantic and typing features separately.

PARAGRAPHS

This movie has it all: hot main…
If you just want to laugh at silly…
It's like every other Titanic…
This is the only movie in my life that I ever walked out of and demanded to get my money back. It's THAT bad! It was out some 15 or so years ago, so I…

SEMANTIC FEATURES

Document term matrix

Word frequency

	P1	P2	P3	P4
movie	2	1	2	1
hot	1	0	0	0
hilarious	1	1	0	0
bad	0	0	0	2
hate	0	0	1	0
spectacular	1	0	0	0

Principal Components

Describes each paragraph in principal component space

	P1	P2	P3	P4
PC 1	0.7	-0.2	0.0	-0.4
PC 2	0.6	0.4	0.2	-0.4
PC 3	0.7	-0.2	0.0	-0.3
PC 4	0.2	0.3	0.4	-0.5
PC 5	0.6	-0.3	0.3	-0.2
PC 6	0.4	-0.4	0.0	-0.5

KEYSTROKE TIMING FEATURES

Mean trigram typing times (ms)

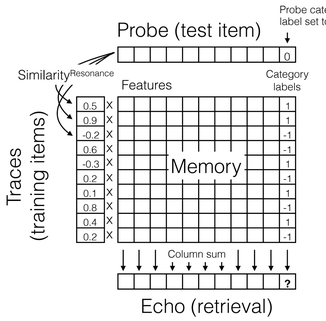
	P1	P2	P3	P4
mov	121	170	100	138
ovi	117	154	0	0
vie	178	188	0	0
bad	0	0	0	165
hat	0	0	110	0
ate	0	0	141	0

Principal Components

Describes each paragraph in principal component space

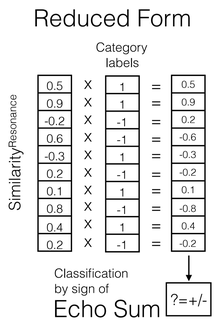
	P1	P2	P3	P4
PC 1	0.8	-0.3	-0.1	0.7
PC 2	0.0	0.9	0.6	2.5
PC 3	-1.2	-1.7	0.1	2.4
PC 4	-0.6	1.1	-1.2	0.5
PC 5	0.8	2.0	-1.3	0.0
PC 6	0.8	-3.5	6.8	-1.4

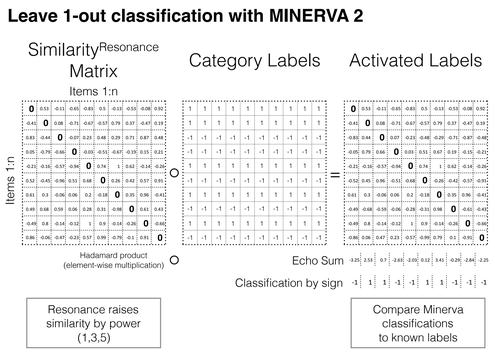
Classification with MINERVA 2



MINERVA 2 (Hintzman, 1986, 1988) is a memory model based on global familiarity and has primarily been applied to category learning and recognition memory.

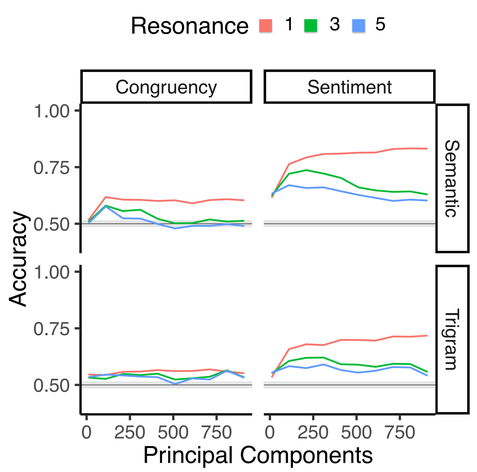
Here, we have adopted MINERVA 2 as a classification tool primarily because of it's simplicity.





Experiment 1: MOVIE REVIEWS

Pretend that you are trying to convince someone to go see the movie _____. In 50 to 75 words, tell them why the movie is GOOD, and why they should go see it. Try to be specific.



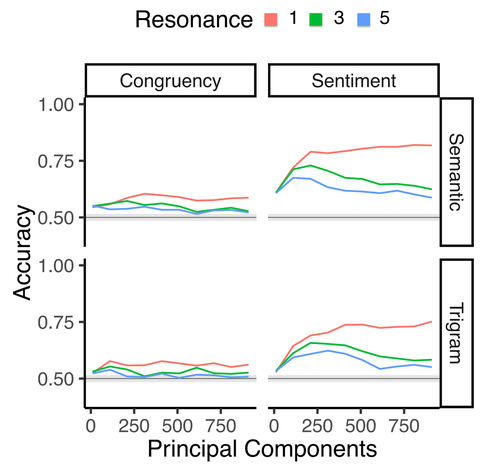
Classification of sentiment was quite good for both semantic (~85%) and typing (~75%) feature sets.

We could also classify congruency above chance.

Though, classification was better using semantic features (~65%) than typing features (~55-60%)

Experiment 2: PRODUCT REVIEWS

Pretend that you are trying to convince someone buy a(n) _____. In 50 to 75 words, tell them why the product is GOOD and why they should buy it. Try to be specific.



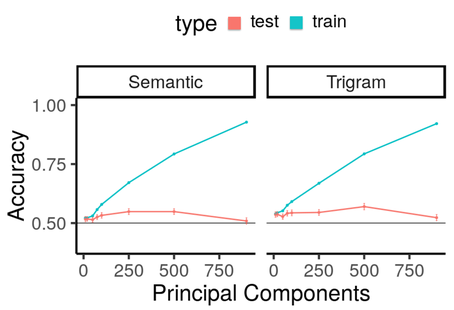
Results were similar to the movie data:

Classification of sentiment was quite good (~75-85%).

Classification of congruency was slightly better for semantic than typing features, but both were above chance (~55-60%)

Experiment 3: STRONGLY HELD OPINIONS

Pretend that you are trying to convince someone that they should hold the SAME opinion as you about _____. In 50 to 75 words, tell them why they should hold the same opinion as you. Try to be specific.



Linear Discriminant Analysis

Leave 1-out (participant)

Generally, classification for congruency was slightly was worse than the other experiments

What's Next?

With relatively simple feature sets we could classify concealed attitudes above chance.

We have only scratched the surface of what we can do with these datasets. There are many more features to include and better semantic models to try (e.g., BEAGLE).

Although, we could classify using typing features, It is still unclear whether it adds to our ability to detect attitudes beyond what we can do with semantic features.

Questions?

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