



Think Again

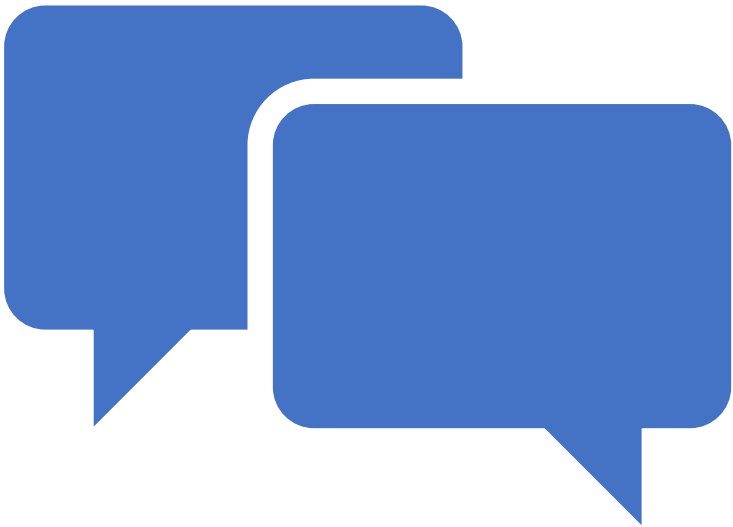
Fall Term 2021

Class 3

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On Tap for Today

- Review
- Startle Response
- Visual Dominance





Review

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- The brain's function is not to think.
 - It is to recognize patterns and make predictions.
 - Sensory input is synthesized, adjusted for identified patterns, and the resulting prediction is brought to conscious awareness.
 - While this process can create false impressions, its speed, efficiency, and usefulness make it a strength rather than a weakness.

Dominance
of Visual

It is important to keep in
mind that political
campaigns are designed by
the same people who sell
toothpaste and cars.

Noam Chomsky

Saccades or Saccadic Movements

- Saccades are rapid eye movements that occur approximately 3 times per second.
- They are quick jerks and then full stops, not designed to help tracking. (comes from French word for jerk)
- We are not aware of them.
- They help us improve our understanding of the object we are viewing by getting numerous perspectives.
- They also prevent fatigue that would otherwise make the object disappear.
- We can consciously stop them for such activities as aiming a gun or threading a needle.

Retinal Fatigue

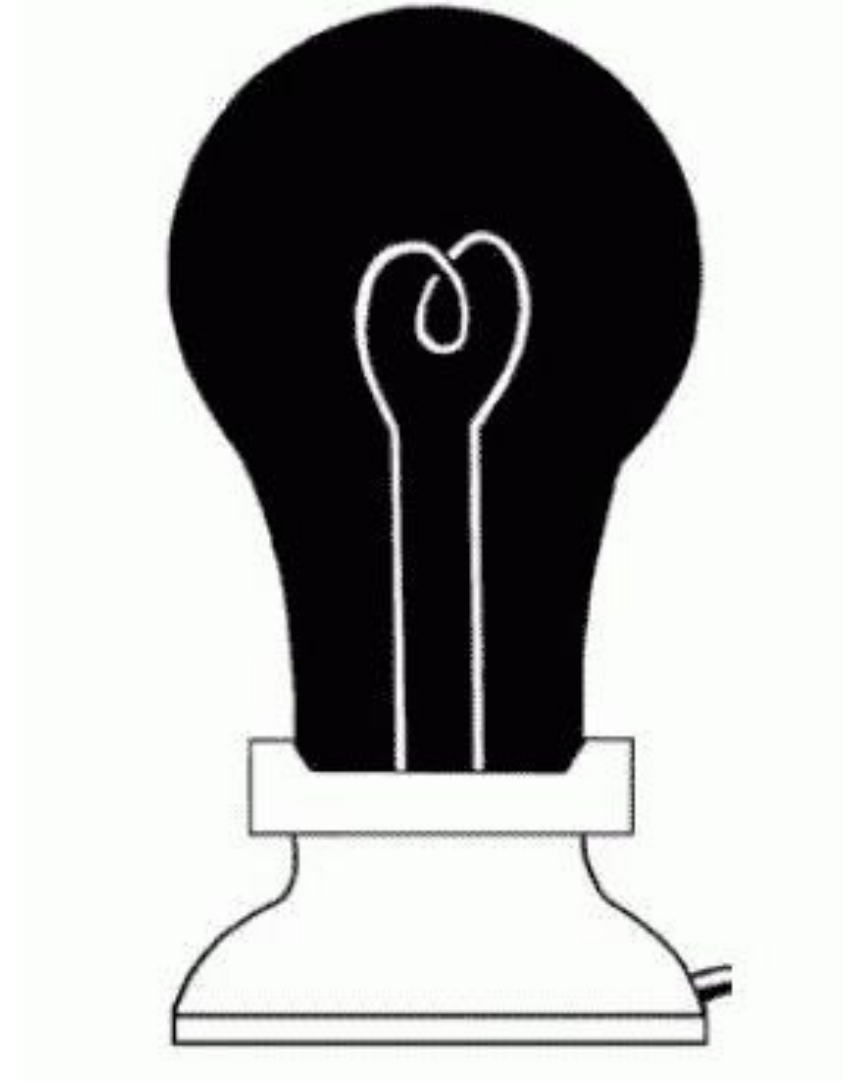
- Image, usually of bright object, causes retinal fatigue over time.
- May result in after-image. Fatigued parts do not react as fully as rested areas creating the appearance of darker or different colored areas.
- Fatigue from looking at green color and then white color may eliminate green from the spectrum resulting in pink or purple.
- Outline created may result in continuing to see image after it is gone or you look away.
- Many variations in type of fatigue and responses to different levels and types of lighting.

What it Means



-
- Visual is the strongest sense people have. Optical illusions are one way to show even that sense can be misleading.
 - Retinal fatigue is another. Simple use can change what we see.
 - What else can do that?
 - How much easier is it to change what we feel or think we feel?
 - Can not feeling angry mean too angry?

Stare at black bulb for 30 seconds and then white area to see glowing bulb.

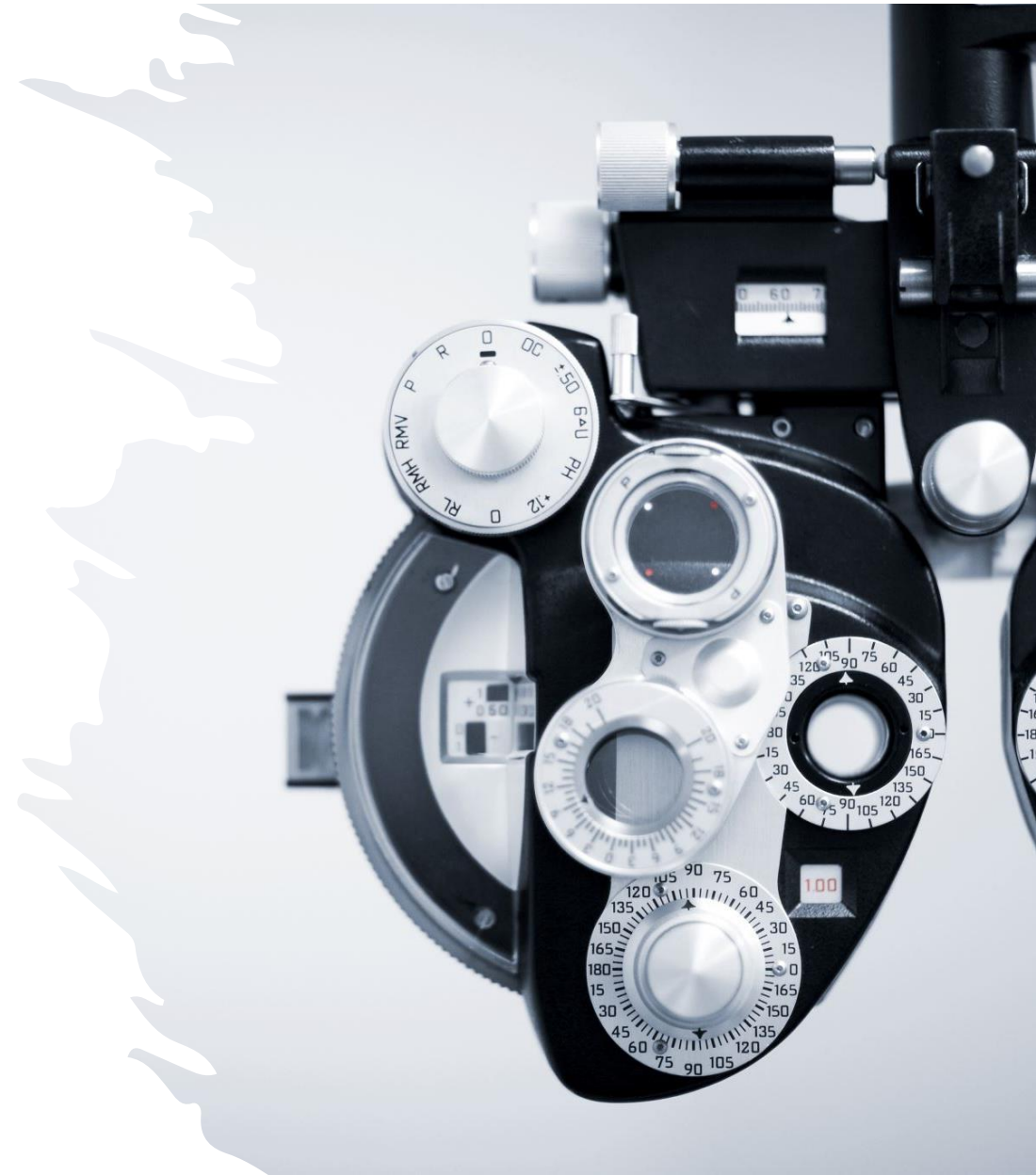


Stare at images for 35 seconds
and then at blank sheet



Illusion of Motion

- Human eye can process 10-12 images per second but varies with conditions and content. (frame rate)
- At that level or below, see individual images. Above that see continuous motion.
- Silent films used 24 images per second or so but felt choppy. Edison claimed 46 needed to see motion without eye strain. Now routinely use higher numbers and repeated images
- Bulbs flicker but at 50 – 90 Hz (Hertz is one cycle per second) and so appears stable. (flicker fusion threshold)



Running Horse



Image changing at 12
per second so
borderline choppy

Subliminal Stimuli

Subliminal Stimuli



- Stimuli picked up by sensory organs and the brain but below the threshold for conscious awareness
- May reach threshold but not rise to conscious awareness because of distraction, other stimuli, or focus elsewhere
- Do they influence us?
- Science has a clear answer to that question.
- Maybe, maybe not

James Vicary

- In 1957 James Vicary claimed he inserted subliminal messages in movie theater ads with pictures of coke and popcorn resulting in popcorn sales up 18.1% and coke sales 57.7%
- Thought everyone would love it since it limited time spent on ads.
- Instead, raised specter of 1984.
- Later retracted claim but not sure whether there was any validity to it.





Subliminal Advertising

- Laboratory research shows effective but in limited situations and at relatively low levels. [study](#)
- Popularity surged in early years but rarely used anymore because of multiple factors:
 - Laws and regulations
 - Limited effectiveness
 - Fear of scandal

Bush RATS Ad

Not technically
subliminal but
meant to be read
without conscious
awareness

[ad](#)



Marlboro ad



- EU banned cigarette ads in many arenas including sporting events.
- Marlboro ad a design that at high speeds looked like its logo.

Research on Affective Pictures

- Much of best research by Piotr Winkielman – careful to put findings in perspective and list alternative hypotheses.
- 2005 study showed people took and drank more of offered drink after seeing subliminal happy faces rather than angry ones. [Link](#)
- No difference between subliminal and supraliminal neutral images
- Subjects had no conscious awareness of change in mood.
- 2007 Winkielman article [link](#)

Pictures vs. Words

- In the same series of experiments, looked at impact of positive and negative faces and images on behaviors such as how they felt about beverages and how much they drank.
- Results were in the expected direction (valence congruent).
- Same experiments using words instead of picture.
- Results were actually in the opposite direction (valence incongruent).
- Pictures had affective impact where words did not.

What do the following have in Common?

- Ray Rice
- Aylin Kurdi
- Drug Ads

Ray Rice – Superstar Running Back for Baltimore Ravens

- February 15, 2014 – Gets into fight in elevator with fiancé, knocks her out
- February 19 – Video released showing him dragging her out of elevator -[link](#)
- March 27 – Rice indicted for 3rd Degree Assault
- May 1 – Pleads not guilty and enters Diversion Program

Ray Rice (cont.)

- May 23 – Ravens hold news conference supporting Rice
- June 24 – NFL suspends Rice for 2 games
- September 8 – In the afternoon, Ravens release Rice and NFL suspends him indefinitely saying he may never be allowed to play again and in fact he has not
- Rice told the truth about the events throughout
- What happened that morning? -[link](#) – 1:00-2:00

Video After Doors Open Was Available Much Earlier.
Video in the Elevator Was New.



Video

Arab Spring becomes Arab Nightmare for Many

-
- Millions Displaced
 - Hundreds of Thousands Killed
 - Millions forced to flee, often by boat across the Mediterranean
 - Mediterranean Overseas Aid Station (MOAS) worked on a shoestring budget and saved over 11,000 people by September, 2015
 - Over 2,500 had died attempting the crossing including numerous children

Money Comes Pouring In



- Numbers and events widely reported with little financial support for MOAS
- In Early September, MOAS received more contributions in a single day than the previous 2 years combined
- What happened on September 2, 2015?



[Nilüfer Demir](#) from [DHA Agency](#)





Why is a picture worth 1000 words? Nature Made Us That Way

- Over 20% of our brain is purely optical and almost 2/3 optically related or connected
- About 30% of the neurons in our cortex are dedicated to optical processing
- Touch is 8% and auditory is 3%
- Optic Nerves contain about 1 Million fibers compared to 30,000 for Auditory Nerves

How it Works

- If conflict, likely to pick most useful and likely to be most accurate. Based on:
 - Architecture – brain capacity
 - Learning – past experience
 - Most conducive to survival
- Inattention blindness (subject of later class) – limited capacity to process and raise to conscious awareness – brain selects which to focus on.

Other Examples

- Words appear to come from person on television screen even if speakers positioned elsewhere.
- Ambulance approaching, if you can see it, you know exactly where it is. If you just hear it, not sure of direction or position.
- Ventriloquism works because we focus on mouth moving rather than direction of sound.

Why Does that Matter?

- Rational thought can evoke emotions but significantly lower in amplitude and response.
- Rational thought requires extra and taxing work that may lessen or even reverse response.
- Our conscious minds can effectively do one thing at a time so visual cues block out other cues.
- Even if both come into consciousness, visual cues create stronger and more dynamic response.

Who Knows This?

- Advertising Agencies
- Political Operatives
- Trial Attorneys
- Anyone who survives by convincing people of their own narrative whether or not it is true
- Advertisers use to be primarily creative types and now more likely to be neuroscientists

The McGurk Effect

- Watch again
 - You know it is a B sound
 - You know you are being shown a picture of a man making an F sound while you are hearing a B sound
 - Watch the video and try to hear the B sound [Video](#)
 - Close your eyes and hear the B sound
- Even when you know that you are being fooled and how you are being fooled, your rational brain cannot override what your brain has been taught do to resolve conflict.

Same Food, Different Colors

- Review of the Literature by Charles Spence, On the Relationship(s) Between Color and Taste/Flavor – [Article](#)
- Studies and experiments date back at least to 1936 when H.C. Moir fed people a wholesome meal with some of the foods unusually colored. Many people complained about the taste and a number complained of stomach pains after eating the food.
- Multiple studies have found similar outcomes with changing ambient noise or sound.

Color and Taste Perception

- Massimiliano Zampini and colleagues conducted a number of studies asking people to describe drinks in terms of flavor and intensity.
- Options included ones that were appropriately colored, inappropriately colored, or colorless.
- Participants were told that the colors provided no useful information.
- Accuracy of flavor description and intensity was significantly lower when the liquids were colored inappropriately as compared to either appropriately or colorless. [Article](#)

Next Time You Encounter a Wine Snob

- In the classic study, 54 wine students in France were asked to describe the aroma of red and white wines.
- They were then asked to apply the same words to the exact same white wines except that one was colored red with an odorless and tasteless food coloring.
- With few exceptions, they used the red descriptors to describe the white wine colored red.
- Similar outcomes have been found with tasting and with experts.
- Study has been used to dismiss the concept of wine expertise but it is really a misapplication of the findings. [Study](#)

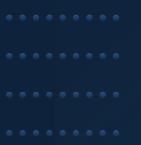
Legal Requirements for Drug Ads

- FDA Requirement - Broadcast product claim ads may make statements about a drug's benefit(s).
- They must include the drug's most important risk information ("major statement") in a way that is clear, conspicuous, and neutral. Do they do that?
- In addition, they must include either every risk or provide enough sources for the audience to obtain the drug's prescribing information ("adequate provision").

Watch These Ads and Notice Visual Cues that Accompany Warnings

- Generally start with showing pain, then relief of pain
- Work on most of us but especially those suffering from the condition
- Almost always say to ask your doctor – research shows that is critical line to generate prescriptions
- Listen to speed and tone of warnings and picture shown while they are read and changes of scenery
- Finish with relief again
- Multiple ads – be aware of changes in how you see them
- [Video](#)

Abilify Ad



ABILIFY is not approved for depression in children under 18.



Video

Other
Depression
Ads

Second Abilify Ad – [Video](#)

Cymbalta Ad – [Video](#)

Pristiq Ad – [Video](#)



Celebrex (Arthritis)

[Video](#)

Pharmaceuticals outbid in Health.

Other Physical Condition Ads

Treximet (migraine) - [Video](#)

Chanix (smoking cessation) -
[Video](#)

Avandia (Diabetes) - [Video](#)

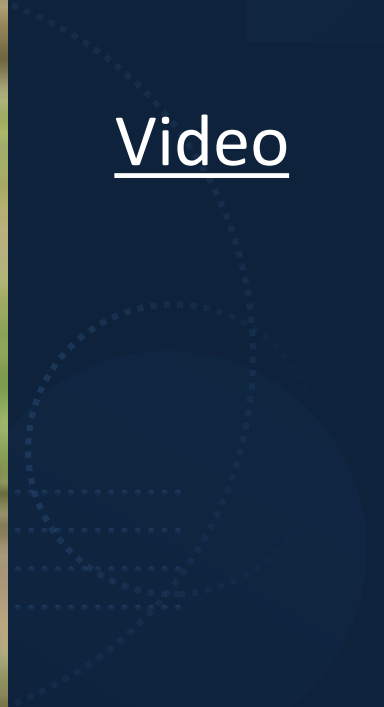
Did it change for you?

- If you do not have the condition, not be as susceptible
- Other characteristics to notice
 - Constantly moving images to force attention
 - Often images move through stages from pain to neutral to happiness to keep our focus and set a mental direction
 - Spoken words often slow and monotone
- Tobacco company anti-smoking ads affect smokers and non-smokers differently

Antihistiminia



Video



www.its.com.br

Deceivia

**SIDE
EFFECTS
MAY
INCLUDE**

Video

JCS

Did it change for you?

- If you do not have the condition, you may not be as susceptible.
- Tobacco company anti-smoking ads affect smokers and non-smokers differently.
- As you watch, the impact of the visuals lessens from boredom and knowledge.
- But if it is emotionally important to you, it never goes away.

Directed Attention

- Conflict between word and color of ink requires activity in the ACC to resolve conflict.
- Ability to do so requires Directed Attention to overcome reflexive response based on word.
- Directed Attention helps us make correct choice but leads to Directed Attention Fatigue (DAF) which leads to incorrect choices and irritability.

Stroop Effect

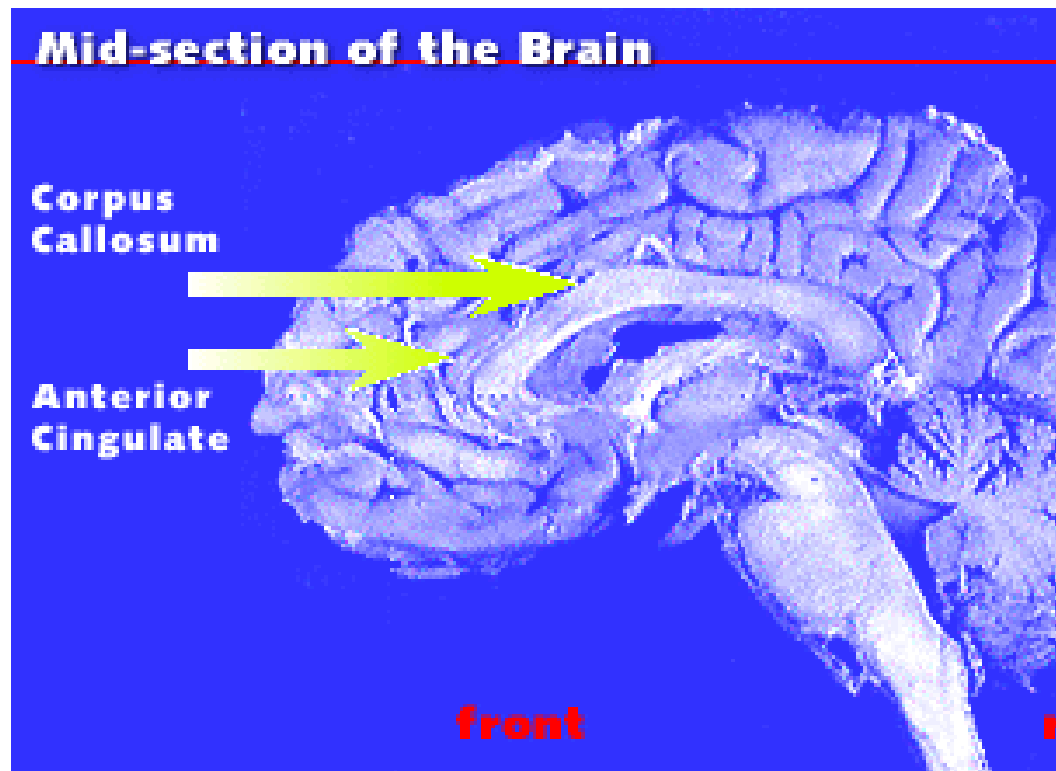
- Research by J. Ridley Stroop for Doctoral Thesis in 1935
- Words are more easily processed than color identification.
- Written words are relatively new, last few thousand years.
- Did not add to brain but repurposed.
- If name of color is written in same colored ink, easy to identify quickly.
- If color of ink is different than name of color, difficult to identify color correctly.



Stroop Test

- Used to measure capacity for Directed Attention
- Those with less impulse control have more difficulty but all have difficulty.
- Also helpful to experience the conflict and fatigue.
- [Stroop Test](#)
- [Timed Stroop Test](#)
- [Explanation](#)

Stroop and the ACC



- Although the functions of the *anterior cingulate* are very complex, broadly speaking it acts as a conduit between lower, somewhat more impulse-driven brain regions and higher, somewhat more thought-driven behaviors. The Stroop effect's sensitivity to changes in brain function may be related to its association with the *anterior cingulate*.

Can We Do Something About It?

- Awareness
- Executive Control – Change Behavior without Changing Perception
- Evolution
- Cognitive Behavioral Therapy (CBT)
- Dialectical Behavior Therapy (DBT)
- Eye Movement Desensitization and Reprocessing (EMDR)
- Entheogens

Example of Bad Research

- Used subliminal pictures of Lipton tea in test group and no hidden message in control group
- Offered choice of Lipton tea or mineral water
- Test group chose 53% Lipton, 47% water
- Control group chose 61% Lipton, 39% water
- Experts agreed the differences were not statistically significant which was true but irrelevant
- With 1,000,000 subjects, .1% difference is statistically significant. With 2 subjects, 100% difference is not
- [article](#)



Latest Study

- Winkielman Study in Frontiers in Psychology [link](#)
- Comparison between faces, objects, words, and varying lengths of exposure – subliminal and supraliminal
- Expected valence congruent for faces and pictures but no difference between subliminal and supraliminal
- Why may facts not matter? Words had mild valence incongruent affect but sample size and affect too small to treat as definitive. Lack of valence congruent affect was statistically significant. Study discusses possible reasons.
- Again no conscious awareness of mood changes.

Sample Ads - Depression

- [Depression Ad 1](#)
- [Depression Ad 2](#)
- [Depression Ad 3](#)
- [Depression Ad 4](#)
- [Depression Ad 5](#)

Sample Ads - Depression

- [Depression Ad 1](#)
- [Depression Ad 2](#)
- [Depression Ad 3](#)
- [Depression Ad 4](#)
- [Depression Ad 5](#)

Sample Ads - Depression

- <https://www.youtube.com/watch?v=tGymr78FtbU&list=PLB989432F3EF2C0A9&index=4>
- <https://www.youtube.com/watch?v=JsqJju3ePJU&index=5&list=PLB989432F3EF2C0A9>
- <https://www.youtube.com/watch?v=OTZvnAF7UsA&index=6&list=PLB989432F3EF2C0A9>
- <https://www.youtube.com/watch?v=uVNZ8ZBP5gY&index=9&list=PLB989432F3EF2C0A9>
- https://www.youtube.com/watch?v=vUBjO7J_UpM

Sample Ads Physical Conditions

- <https://www.youtube.com/watch?v=Pc9PHD-hz7E>
- https://www.youtube.com/watch?v=3hp_y0wDFz0&list=RDsiMPY5FjlaY&index=5
- <https://www.youtube.com/watch?v=b0IB9T1UN4s>
- <https://www.youtube.com/watch?v=EL-Njsi7AU4>
- <https://www.youtube.com/watch?v=-NvwHbOGqMw>

Sample Ads Physical Conditions

- [Migraine Ad 1](#)
- [Smoking Cessation 1](#)
- [Diabetes Ad 1](#)
- [Arthritis Ad 1](#)
- [Arthritis Ad 2](#)

Taste Capacity Differs Dramatically

- Tasters are often characterized as supertasters, medium tasters, and non-tasters.
- Supertasters have 16 times as many taste buds as non-tasters.
- There are a number of genetic variations that impact how we taste and what we like.
- The variations, along with the low number of subjects, result in inconsistent outcomes among research studies.

Spooofs on Ads

- Antihistimania
- <https://www.youtube.com/watch?v=siMPY5FjlaY>
- Deceivia
- <https://www.youtube.com/watch?v=6utYAeLquYI&index=2&list=RDsiMPY5FjlaY>

Same Fact Different Conclusion

- Medical examination consistent with sexual abuse –
- Medical examination not inconsistent with sexual abuse
- Reference – no medical findings
- DNA identify suspect with 99% accuracy
- Possible suspects narrowed down to 150,000
- The physical description exactly matched that of the defendant
- He had two arms

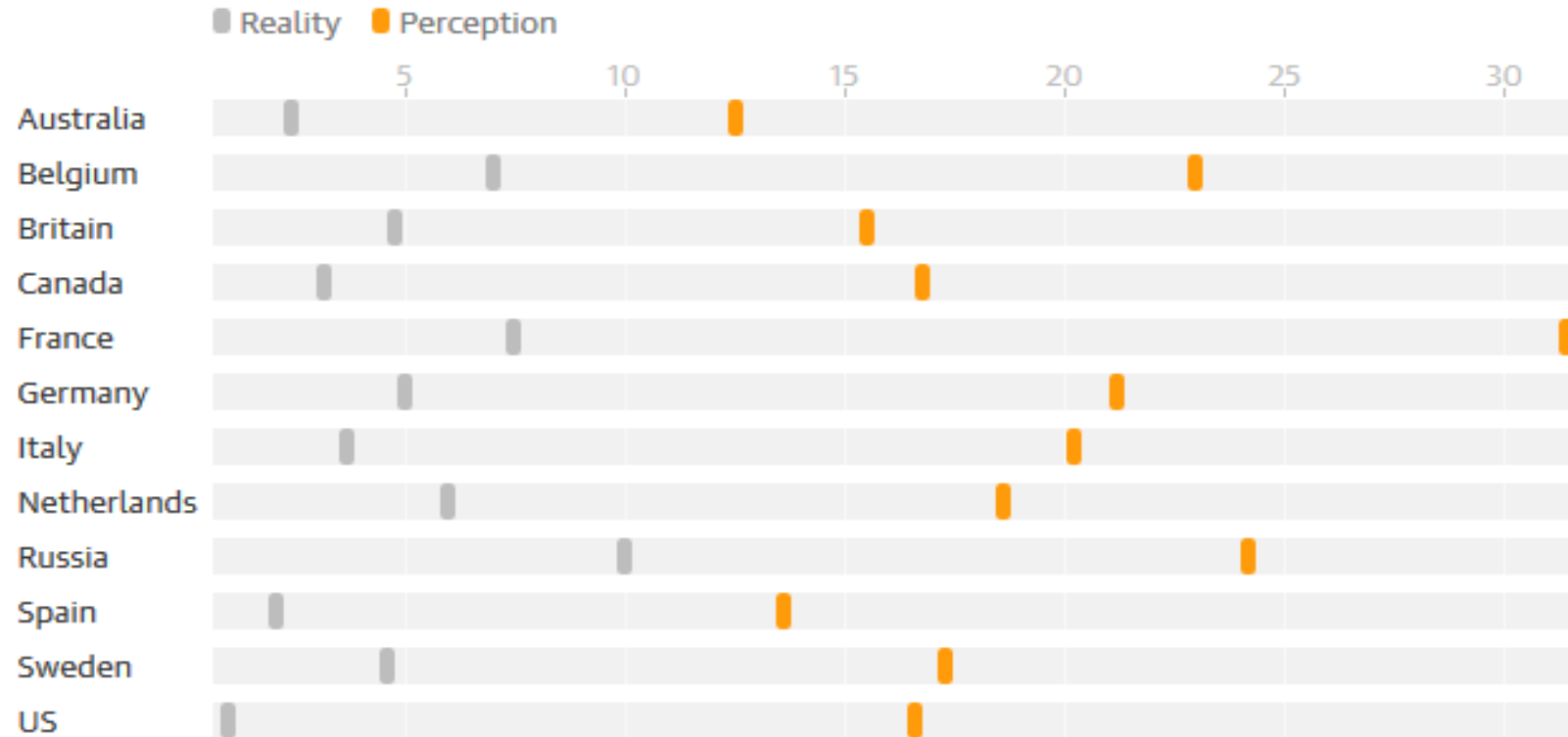
Other ways our rational minds are fooled

Don't Think of a White Bear

- With that instruction, more likely to think of Polar Bear than without it
- Think about jury instruction to disregard testimony or question – actually makes it more likely to think about
- Anatomy of a Murder – 54:30 – 55:07 - [film](#)

Estimates of Muslim Population

- Muslim Estimates



Spoofs on Ads

- [Antihistimania](#)
- [Deceivea](#)