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	Author(s)	Citation/Source	Usage	Web Link?	Relative Impact on this Project
	Jennifer S. Lerner, Ye Li, Piercarlo Valdesolo, & Karim S. Kassam	Lerner, J. S., Li, Y., Valdesolo, P., & Kassam, K. S. (2015). Emotion and decision making. *Psychology*, *66*, 799-823.		http://www.annualreviews.org/eprint/vVKIPZU5r9dTCzbgdD3M/full/10.1146/annurev-psych-010213-115043	
	Richard S. Lazarus	Lazarus RS. 1991. Emotion and Adaptation. New York: Oxford Univ. Press	disgust is the feeling of being too close to a contaminating object.	Physical Book	
	Rozin, Haidt, & McCauley	Rozin, P., Haidt, J., & McCauley, C. R. (2000). Disgust. In M. Lewis & J. M. Haviland-Jones (Eds.), Handbook of emotion. New York: Guilford Press.	"parent–child transmission underpins disgust acquisition"	Physical Book	
	Viar-Paxton, Ebesutani, Kim, Ollendick, Young, & Olatunji	Viar-Paxton, M. A., Ebesutani, C., Kim, E. H., Ollendick, T., Young, J., & Olatunji, B. O. (2015). Development and initial validation of the Child Disgust Scale. *Psychological assessment*, *27*(3), 1082.	Discussion of the social nature of disgust and what it can lead to later in life	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4821989/	
	Stevenson, Oaten, Case, Repacholi, & Wagland	Stevenson, R. J., Oaten, M. J., Case, T. I., Repacholi, B. M., & Wagland, P. (2010). Children's response to adult disgust elicitors: Development and acquisition. *Developmental psychology*, *46*(1), 165.	Study with parents and children demonstrating age effects and parent-child transmission of disgust	http://psycnet.apa.org/buy/2009-24671-007	
	Widen & Russell	Widen, S. C., & Russell, J. A. (2010). The "disgust face" conveys anger to children. *Emotion*, *10*(4), 455.	Study showing age effects of disgust detection	http://cepa.stanford.edu/sites/default/files/Widen&Russell%202010-The%20disgust%20face%20conveys.pdf	

	Lawrence, Campbell, & Skuse	Lawrence, K., Campbell, R., & Skuse, D. (2015). Age, gender, and puberty influence the development of facial emotion recognition. *Frontiers in psychology*, *6*, 761.	Study showing age effects of disgust detection	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4468868/pdf/fpsyg-06-00761.pdf	
	Lerner, Small, & Loewenstein	Lerner, J. S., Small, D. A., & Loewenstein, G. (2004). Heart strings and purse strings carryover effects of emotions on economic decisions. *Psychological science*, *15*(5), 337-341.	Study of appraisal tendency theory relating to disgust (economic effects)	http://journals.sagepub.com/doi/abs/10.1111/j.0956-7976.2004.00679.x	
	Woo-Young Ahn, Kenneth T. Kishida, Xiaosi Gu, Terry Lohrenz, Ann Harvey, John R. Alford, Kevin B. Smith, Gideon Yaffe, John R. Hibbing, Peter Dayan, and P. Read Montague	Ahn, W. Y., Kishida, K. T., Gu, X., Lohrenz, T., Harvey, A., Alford, J. R., ... & Montague, P. R. (2014). Nonpolitical images evoke neural predictors of political ideology. *Current Biology*, *24*(22), 2693-2699.	The fMRI study	http://www.cell.com/current-biology/fulltext/S0960-9822(14)01213-5	
	Yoel Inbar and David A. Pizarro Cornell University, Ithaca, New York, USA Paul Bloom Yale University, New Haven, Connecticut, USA	Inbar, Y., Pizarro, D. A., & Bloom, P. (2009). Conservatives are more easily disgusted than liberals. *Cognition and emotion*, *23*(4), 714-725.	Conservatives are more easily disgusted than liberals, specifically relating to gay marriage and abortion.	https://www.tandfonline.com/doi/abs/10.1080/02699930802110007	
	Yoel Inbar, David Pizarro, Ravi Iyer, and Jonathan Haidt	Inbar, Y., Pizarro, D., Iyer, R., & Haidt, J. (2012). Disgust sensitivity, political conservatism, and voting. *Social Psychological and Personality Science*, *3*(5), 537-544.	Figure showing the correlation between disgust sensitivity and conservatism in the U.S. and around the world		
	Eyeslikedaisies (Username on Sporcle)		Sporcle quiz	http://www.sporcle.com/games/eyeslikedaisies/inside-out-emotions/results	
	Dan Jones (Of newscientist.com)	"Left or right-wing? Brain's disgust response tells all"	The team found that these neural signatures of	https://www.newscientist.com/article/dn26	

		October 30, 2014	disgust can be used to predict political orientation. “In fact, the responses in the brain are so strong that we can predict with 95 per cent accuracy where you’ll fall on the liberal-conservative spectrum by showing you just one picture,” says Montague. “This was surprising as there are no other reports where people’s response to just one stimulus predicts anything behaviourally interesting.”	481-left-or-right-wing-brains-disgust-response-tells-all/	
				https://www.psychologytoday.com/articles/199801/mystery-disgust	

Mud-Skippers Fish Gobiidae (order Perciformes) Mumbai DSCF0311 (15)
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https://commons.wikimedia.org/w/index.php?curid=18535116

https://www.sporcle.com/games/chxrlotte10/inside-out-characters/results
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https://www.sporcle.com/games/stefantastic/pixar-inside-out/results

Dan Blatherwick: Sound Designer https://www.danblatherwick.com/
Matt Mignogna: Conjecture https://www.youtube.com/channel/UCSTwYbmgquOwStjvyjYWD4Q
Zach: Extra Fabulous Comics http://extrafabulouscomics.com/
Cherep: Virtual Reality Researcher [4 Yawkey Way, Boston, MA 02215]
Patrick Foote: Name Explain https://www.youtube.com/channel/UCy_QZ1EEY4S5YT6cmBTwMwg
Peasley: Object Recognition Researcher [01001110 01100101 01110010 01100100]
Jonathan Moore: Soliloquy https://www.youtube.com/user/Soliloquy084
Tristan Johnson: Step Back History
https://www.youtube.com/channel/UCxTdWpLJurbGlFMWOwXWG_A
Castillo: Cultural Psychology Researcher [https://imgur.com/gallery/GFkGE6W]

Hey ARTizens, it's time to get emotional, because researchers claim that the way a person experiences disgust can predict their political position on the conservative-liberal spectrum. Allow me to explain!

INTRO "Disgusting Politics"

The claim is that by using an fMRI scan to read the bloodflow in the human brain while that person is looking at a disgusting picture, scientists can predict with above 95% accuracy whether someone is more liberal or conservative in their political views. That is a BOLD (blood oxygen level dependent) claim, so let's back up for a minute first. Why would that hypothesis even make sense in the first place?

Well, when considering the six classical emotions, happiness, sadness, anger, fear, surprise, and disgust, the one that is the weirdest is disgust, in a few different ways. We will get into the science later, but for now, let's explore the weirdness.

First, disgust is the least regarded of the classical emotions. What I mean by that is that people rarely think about disgust, they don't think disgust is very important, and they have a hard time visualizing and depicting disgust.

Of the six classical emotions, disgust appears to be the most forgettable. I asked a group of my friends to generate names of emotions that they consider important to a person's life. Then I classified those generated names under whichever of the six classical emotions was closest in definition. The order of the six from most mentions to least was happiness, sadness, anger, fear, SURPRISE, and then disgust. And, fun

fact, in the movie Inside Out, Disgust is the most forgettable emotion when people are quizzed on the names of the characters in the film.

I also asked my friends to draw faces based upon the six classical emotions. The catch was, each face had to be drawn using only six lines maximum, so they had to be very simplistic drawings. I then asked them to rank how difficult they felt that the six emotions had been to draw. Not only did disgust get the highest average difficulty ranking, but the ways in which the disgust faces were drawn varied dramatically, as opposed to the other emotions which seemed to be somewhat more consistent in their depiction.

So, disgust seems like it might be different from the other emotions. Why is that? Well, that leads us to the second weird thing, it turns out that disgust, is a social emotion.

Disgust seems to be at least partially a social response that develops over time with exposure to a community's values, as opposed to an emotion that a child is innately born with. There does appear to be a core biological component to disgust that everyone is born with, but the way that children are taught to apply that feeling to social and moral values, called the sociomoral component of disgust, and their level of disgust sensitivity, is to some degree taught to them (Viar-Paxton et al. 2015). First of all, compared to other emotions, disgust seems to take longer to develop.

Studies [Lawrence, Campbell, & Skuse, 2015; Widen & Russell, 2010] that compare emotion recognition in children find that children younger than 10 years old or so have the most trouble with recognizing disgust

when compared with the other classic emotions. Which might help explain why kids are so disgusting. They stick to things like suckerfish (comparison to suckerfish and kid on glass sliding door).

All emotions are socially constructed to some degree, but disgust is the emotion that shows up latest in development, and is demonstrably acquired via social transmission. One great study that illustrated this had children of different ages consider disgusting things either by themselves or in the presence of their parent (Stevenson, Oaten, Case, Repacholi, & Wagland, 2010). Not only did the age of the child matter for their rating of disgust, with younger children being less disgusted, but parents were shown to direct disgusted responses at the children, especially if they were younger. The general finding in the literature is that "parent–child transmission underpins disgust acquisition" (Rozin et al., 2000)

That is, a child's disgust sensitivity is to some degree taught to them, which then leads to differences later in life. So now the question becomes, what are those life differences, what does disgust do?

One useful theory for understanding what emotions do is the Appraisal Tendency Framework (Lerner & Keltner, 2000, 2001), which posits that emotions differ from one another in how they trigger specific associated goals. That is, feeling a certain emotion will make you want to do certain things. Like being angry makes you want to knock some heads while being afraid makes you want to run ahead. So, does disgust induce a separate and specific state of associated goals?

One way we could find out is by measuring disgust's incidental effects on behavior. That is, how being disgusted affects performance on a task

that is unrelated to the creation of that disgusted feeling. For example, being sad might make you less likely to go to the grocery store, even though you being sad has nothing to do with the grocery store itself. Unless it is in which case it might be. Staying home from the store is in this case an incidental effect of sadness. So, what does disgust make a person want to do?

Well, according to this book (Lazarus 1991), disgust is the feeling of being too close to a contaminating object. Spoiled food, disease, and unwanted visitors are common elicitors of this feeling.

Based on this definition, researchers speculated that two implicit goals of disgust would be to expel currently owned objects and to avoid taking on any new object. You can think of this policy of expulsion and avoidance as similar to the disgusting urge to vomit and the resulting loss of appetite.

One group of researchers (Lerner, Small, & Loewenstein, 2004) decided to test this with an economic task - basically, a game in which you buy and sell things. They decided to make participants in the study watch a video designed to induce either, sadness, disgust, or a neutral state. Then they compared the participants' willingness to buy and sell objects at varying prices (highlighter sets) and looked at how their willingness changed based upon which video condition they had randomly participated in. So, did incidental sadness and disgust have different effects on buying and selling behaviours?

Yes, they did! Sad participants sold their objects at lower prices, and bought objects at higher prices, which the researchers theorized mirrored

a sad person's urge to change the state that they were currently in. That is, not feeling much joy from the object in their possession so they were willing to part with it in exchange for less money, and also, maybe having something new will make them feel happier, so they were willing to pay more for a new object.

The disgusted participants were also willing to sell their objects for low prices, but on the other hand, they were only willing to buy new items for extremely low prices. This matched the hypothesis, in which participants were expected to try and expel current possessions while avoiding new ones, as is seen in the emotion of disgust.

So, what does disgust do? It makes a person want to expel and avoid things that might be contaminated, and the things that cause this feeling are taught to you as you grow up. So if you really want to prank your kids, teach them from a young age how disgusting candy is, (Careful Billy, candy's got the cooties) and then when they go trick-or-treating, them twizzlers are all yours!

Here's where things get really interesting. Researchers have found that they can use disgust to detect political ideologies.

It turns out that a person's disgust sensitivity is an extremely good predictor of how conservative they are. More disgust sensitivity, leads to more desires to expel and avoid contaminated people and objects, which correlates with more conservative ideology. A study of more than 25,000 Americans showed a clear trend as evidenced by this graph here (Inbar, Pizarro, Iyer, & Haidt, 2012). A study of thousands of respondents from 121 different countries also showed the same pattern.

And it gets even more interesting. A team of researchers used machine learning to teach a computer to guess a person's political ideology by reading how the blood flow in their brain, representing brain activity, changed when looking at a picture, specifically a photo of a mutilated animal. The differences in brain activity were small, but consistent enough that one of the authors of the study claims that showing a single disgusting image to a person is enough to detect which direction they lean politically - conservative or liberal - with 95% accuracy. (Ahn et al., 2014)

So, you might expect that if conservatives feel more disgust, that they would also show increased expulsion and avoidance behaviors towards the things they were taught to be disgusting when growing up. And you would be right. Conservative beliefs in the United States include the expulsion of LGBT people from communities and services and avoidance of abortion, and both of those beliefs correlate strongly with disgust sensitivity (Inbar, Pizarro, & Bloom, 2009).

This seems in line with my own perceptions of conservative beliefs in the United States. The recent focus of Republicans on the expulsion of immigrants and the building of a border wall to try and avoid incoming immigrants seems like a perfect modern example.

So, there's the evidence. It's plausible that conservative upbringing leads to disgust sensitivity which leads to conservative beliefs. But a lot of the evidence, especially the fMRI study, is correlational. We don't know that disgust is a specific cause of conservatism, but we do know that there is

a lot of disgust affiliated with conservative beliefs, enough to read someone's brain.

Thanks for watching this episode of ARTexplains, be sure to click the like button if you found this interesting. If you want to help me make more videos, I have a patreon where you can support the channel. The other best way to help this channel grow is to share a video with a nerdy friend, so please consider doing so. Okay, that's enough self-promotion for now, it's getting a bit disgusting. I'll see you next time!