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MAPKIA! episode 73 sequel: Scholars who genuinely know something explain disgust's contribution to vaccine & GM food risk perceptions

Dan Kahan Posted on Thursday, June 18, 2015 at 10:48AM

*This post is part of the settlement of the class action lawsuit filed after **@Mw was declared the winner** of the now infamous "**MAPKIA!**" **episode 73**. The other part of the settlement was a \$54.75 billion punitive damage award to loyal listener **@Cortland**. But anyway, this is a really **cool** post on data from an "**in press**" **paper** that examines the impact of disgust on GM-food- and vaccine-risk perceptions. Enjoy!*

**Needles in our veins and in our food:
Disgust sensitivity predicts attitudes
toward vaccines and genetically modified
foods**

Dane Wendell & Scott Clifford



beginning of the epic MAPKIA battle ...

The **MAPKIA question** we arrived at **via Twitter** was

What sorts of individual characteristics or predispositions, if any, account for the observed relationship between vaccine- and GM-food-risk perceptions and what, if anything, can we learn about risk perceptions generally from this relationship?

We enjoyed and appreciated this **follow-up post from Dan**, which argues that attitudes towards vaccines and GM food are predicted by a generalized disposition to be worried about anything, rather than a substantively meaningful dimension such as disgust sensitivity. **But, we disagree with that explanation!** And we want to put forward three points:

- First, disgust sensitivity is a very good potential explanation.
- Second, we have evidence that disgust sensitivity has a fairly robust relationship to genetically modified food (GM Food) and anti-vaccine attitudes (anti-vax). And, these attitudes are unrelated or weakly related to political ideology.
- Third, the risk perceptions evidence in the previous post may actually reinforce our argument, not dismantle it.

Why disgust?

Why disgust? Disgust is part of the behavioral immune system, an emotion that motivates avoidance of contamination, such as the consumption of toxins, physical contact with a diseased person, any breaking the skin, and the expulsion of potential toxins from the body. Disgust is a powerful drive that deeply motivates humans because it leads to bodily health and reproductive fitness. Disgust is extremely hard for us to inhibit.

In one of our **favorite studies**, Rozin and colleagues (1986) find that subjects are reluctant to eat delicious, safe chocolate if the chocolate has been molded to resemble dog poop.

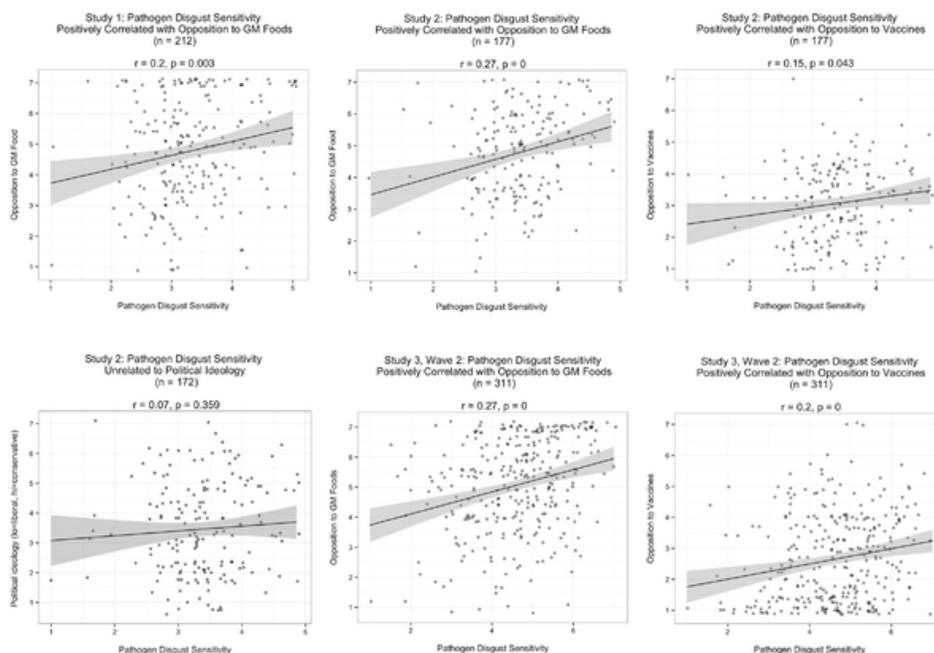
The purpose of disgust is to help us avoid illness. When our team realized that GM foods and anti-vaccination attitudes did not seem related to political ideology, we began to wonder what could be underlying those attitudes. The cases of vaccines and GMO foods both involve *literally* introducing gross, unnatural things into the body. Because of this, we began to suspect that disgust sensitivity could be related to these attitudes.

it's a plausible surmise, and it ought to be directly tested. So, we did!

What does our evidence say?

Our argument, and indeed, a lot of evidence that we've collected, suggests that both vaccine attitudes and GM food attitudes are correlated with pathogen disgust sensitivity. Our paper under review examines disgust sensitivity and a number of issues related to food and health politics in three studies (a total of 612 Amazon Mechanical Turks and 177 students). We find that people who are more disgust sensitive in this way are also more opposed/skeptical of vaccinations and GM foods.

Our outcome measures are not the same as the risk perceptions: we are measuring policy attitudes like mandatory labeling of GMOs and vaccination beliefs about safety and efficacy.



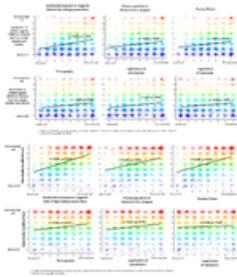
click for mind-blowing higher res! *Not* at all disgusting! The scatterplots show the basic relationships, but note that full regressions with control variables (ideology, education, sex, income, age) make the relationships even more pronounced. Here is a [link to the pre-print paper](#), which includes this discussion as well as some null findings, too.

It is also worth noting that self-described political ideology is, itself, unrelated to pathogen disgust sensitivity. Disgust sensitivity explains something about these attitudes that political ideology does not.

We can also note that several specific political attitudes (e.g. expanding War on Terror, defense spending) also do not seem related to pathogen disgust sensitivity, suggesting, again, that pathogen disgust sensitivity does not necessarily affect all political attitudes, just those that have a clear health connection.

How does risk perceptions analysis demonstrate disgust?

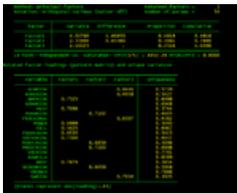
So, what do we make of all of the other risk perceptions that were presented in the [MAPKIA episode 73 "answer"](#)?



click it! c'mon ... c'mon! When looking at the factor analysis provided, we believe that the two factor structure is actually supportive of our theories.

We argue that factor 1 is related to pathogen disgust, and factor 2 is related to sexual disgust.

According to Tybur and colleagues (Tybur et al. 2009), pathogen disgust is concerned with the avoidance of infectious microorganisms, while sexual disgust is the avoidance of sexual partners and behaviors that threaten reproductive fitness. We have found that these domains of disgust are rather important for the study of political attitudes. For example, in our research, sexual disgust is strongly correlated with political ideology, but pathogen disgust is uncorrelated or weakly correlated. Not specifying the disgust domain risks conflating what is really going on in the data.



you're hooked now... no choice but to click Pathogen disgust is distinguishable from sexual disgust, so we would not expect a very strong relationship between GM attitudes (pathogen disgust) and pornography (sexual disgust), for example. Similarly, in our data, sexual disgust does not predict GM attitudes once pathogen disgust is accounted for.

These disgust domains potentially hold great explanatory power for our question today. Our interpretation is that the first factor is picking up concerns about pathogen disgust (while the second is related to sexual disgust). What do GM foods, pesticides, food coloring, saccharine, and (presumably faulty) beef all have in common? Well, they're "unnatural" things that you consume, and thus raise pathogen concerns.

Now, power lines and cell phones fit less clearly with our explanation (and load less strongly), but both fit with concerns about unseen things causing cancer (disease!).



oh--& here are the risk perception items! True, as Dan notes, vaccines do not load strongly on that first factor. This could be an interesting consequence of how vaccines both contaminate the individual and protect the individual from illness. Asking respondents how risky "vaccines" are may depend on how/where the respondents assess the risk (initially risky? Or risky in the long term) or for

whom. That said, we would have expected vaccines to load in the first factor, alongside other food/health risks.

Two additional tests come to mind.

First, if the first factor getting picked up in the factor analysis is just a general risk disposition, then it should be strongly correlated with both of the remaining factors. And the more strongly correlated it is, the more evidence in favor of **Mw**.

Second, our own hypothesis would predict that the first factor is more strongly related to the second factor than the third. This is because while pathogen and sexual disgust are distinct, they are of course related. So if we are right, and this first factor represents pathogen concerns, then it should be more strongly related to sexual concerns than concerns about harm and authority (or “hierarch communitarians” and “egalitarian individualists” in Dan’s terminology).

We look forward to seeing the results!

We also think this approach might shed some light on misconceptions about anti-vaccination and anti-GM attitudes.

As Dan notes at the end, there are many stereotypes about these people, particularly that they are made up of one distinct group of **Whole Foods People aka "Over-privileged Rich People"**.

But the data doesn’t bear this out. We don’t find this particularly surprising, precisely because these attitudes arguably do not form a widely adopted cultural group. There are likely a few relatively visible cases of people who fit this whole foods stereotype and have created a belief system that upholds all of these attitudes. But most people don’t read Natural News and haven’t been exposed to all of these debates and thus have not yet had the relevant dispositions activated. Not to mention, they probably have lots of good countervailing reasons to not hold these attitudes.

References

Rozin, Paul, Linda Millman, and Carol Nemeroff. 1986. “Operation of the Laws of Sympathetic Magic in Disgust and Other Domains.” *Journal of Personality and Social Psychology* 50(4): 703–12.

Tybur, J. M., Lieberman, D., & Griskevicius, V. (n.d.). Microbes, mating, and morality: Individual differences in three functional domains of disgust.

Update on Friday, June 19, 2015 at 5:39PM by **Dan Kahan**

This was such a cool post, I had to **write one commenting on it**.

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==> ... And, these attitudes are unrelated or weakly related to political ideology.

I'm a bit curious about this...

It seems to me that "distrust of government" is likely to run across political ideology and also be associated with both distrust of GMOs and distrust of vaccines.

For example, if you go to Prison Planet you find anti-government (and anti-big business, anti-medical establishment) libertarians who are strongly distrustful of GMOs and vaccines just like you will find a similar configuration of beliefs with some who tend more towards a lefty political orientation.

How have you controlled for the possibility that more than one political ideology can predict all three of distrust of government (big business, the medical establishment, etc.) distrust of GMOs, and distrust of vaccines?

But of course, that doesn't mean that all leftists or all libertarians have such views, or even a large % of them - which would help explain why GMOs and vaccines are not highly polarized issues when seen in the context of larger society.

June 18, 2015 | [Joshua](#)

@Joshua--

Ideology has small impact on "Factor 1" (the one on which GM food risk perceptions load), but it is being "left-leaning" that is associated with higher risk perceptions, and the more so as science comprehension increases.

I haven't checked but I'll eat my **"I ♥ Popper/Liberal Republic of Science" t-shirt** if weren't the case that being left predicts more concern over "Factor 3," on which fracking & nuclear power both load. Why wouldn't those be "distrust of govt" too?

"Distrust of govt" as risk regulator is a consequence, not a cause, of the disposition that generates the risk perception.

June 19, 2015 | [dmk38](#)

==> "Ideology has small impact on "Factor 1""

Seems to me that would have to depend on how "ideology" is defined. I'm talking about an "ideology" which predisposes someone towards distrust of government relative to other people. That "ideology" is shared by **some libertarians and lefties - in an issue-dependent manner.**

Again, I look at Prison Planet and their stuff on GMOs, vaccines, etc., and it fits, IMO, with their libertarian outlook. They also rant about fracking and nuclear energy - but to a lesser degree. It's interesting that, to me, there is some overlap with many of my lefty friends who have the same kinds of root-level mistrust, a mistrust that coincides with a lack of trust in government. But it is a selective lack of trust in

government. I'm not suggesting that with the issues it is as pervasive or deeply-rooted mistrust as with the libertarians.

==> "Why wouldn't those be "distrust of govt" too?"

I'd guess they would be. Distrust of governments, or perhaps more specifically government which is disproportionately influenced by private sector lobbyists, medical establishment lobbyists, etc, would seem to me to be associated generally with distrust of fracking, nuclear energy, GMOs, and vaccines. Again, check out Prison Planet.

That isn't to say that when government does do something like ban fracking (as in my state of New York), distrust can't be overcome. Expecting ideology to be consistent across different issues seems more to me like an unrealistic notion of ideology. If we're defining ideology only by viewpoints that are held which are consistent, virtually no one has any ideologies.

June 19, 2015 | [Joshua](#)

@Joshua--

Okay.

Someday, someone, somewhere will come up w/ valid "trust" measures, I imagine.

June 19, 2015 | [Dan Kahan](#)

I think that we need further analysis back a few steps, to see how "trust" and "disgust" are created and enhanced by special interest groups who attempt to position new issues in ways that will resonate to their benefit with regards to policy making or consumer marketing.

Some synthetic chemical products, hand sanitizer for example, have successfully positioned themselves on the "purity" side, even though in many instances, one's skin would be better protected with its natural assortment of microbes. Similarly, the emerging food production by greenhouse hydroponics, a very artificial process, is being positioned as offering greater purity than analogous products, like lettuce, that are grown in natural soils.

I think that part of this has to do with the efforts of corporations to wrap themselves in the cloak of "science" and to blur the distinction between pure science and what are actually chosen applications of science based technology. Real, science driven debates about GMOs would not just center on whether or not current products are safe to consume.

For GMOs: In my opinion, it is not clear that the introduction of GMO foodstuffs necessarily had to fall on the negative side of the "disgust" emotion. I believe that this is strongly related to the desire of Big Food and Big Ag to resist public disclosure and transparency. This resistance to disclosure has a long history in such things as food and pesticide labeling, plant and field inspections, and environmental and OSHA related concerns. Thus, not all directly related to the science of genomics.

In some hypothetical alternative universe, with full

transparency, it might be seen that knowing that ones' food had a well-documented history, would be highly desirable from a "purity" standpoint. A database with information, (even if actually unread by most consumers) from seed stock all the way to table, could be a marketing plus.

Such disclosure, however, might open greater debate regarding which GMOs are developed and introduced, and how such introductions are implemented.

June 21, 2015 | [Gaythia Weis](#)