

Oxley, D. R., Smith, K. B., Alford, J. R., Hibbing, M. V. Miller, J. L., Scalora, M., Hatemi, P. K. & Hibbing, J. R. (2008) Political attitudes vary with physiological traits. *Science* Vol. 321 (19) September.

ABSTRACT

Although political views have been thought to arise largely from individuals' experiences, recent research suggests that they may have a biological basis. We present evidence that variations in political attitudes correlate with physiological traits. In a group of 46 adult participants with strong political beliefs, individuals with measurably lower physical sensitivities to sudden noises and threatening visual images were more likely to support foreign aid, liberal immigration policies, pacifism, and gun control, whereas individuals displaying measurably higher physiological reactions to those same stimuli were more likely to favor defense spending, capital punishment, patriotism, and the Iraq War. Thus, the degree to which individuals are physiologically responsive to threat appears to indicate the degree to which they advocate policies that protect the existing social structure from both external (outgroup) and internal (norm-violator) threats.

Physiology may not be (political) destiny

PsyCrit, February 25, 2009

In 2005, three social scientists concluded, on the basis of a “classical twin study,” that “political attitudes are influenced much more heavily by genetics than by parental socialization” (Alford, Funk, and Hibbing 2005, 164). In the current article, the same authors (joined by a number of other researchers) claim to have identified what they term a “potentially heritable physiological mechanism” – the “threat response” – that predicts, and indeed is causally linked to, political attitudes.

The authors measured the physiological “threat response” in two ways: Changes in skin conductance, and the magnitude of the orbicularis startle blink reflex. The skin-conductance measure worked like this: 46 participants were shown three separate “threatening” images – a large spider on the face of an attractive young woman (whose expression is not one of unmitigated fear, since she seems to be expressing exaggerated disgust in an almost self-consciously comical fashion); a dazed individual with a bloody face; and an open wound with maggots on it – interspersed among thirty “non-threatening” images (e.g., a bunny, a bowl of fruit, a happy child). The average skin-conductance change elicited by viewing “non-threatening” images was compared with the average change elicited by “threatening” images. Startle-blink reflex was measured by presenting subjects with a “threatening” stimulus – a loud burst of white noise at seven unexpected moments while subjects were looking at a computer screen which contained a fixation point – and then measuring their blink amplitude.

According to the authors, those who exhibited a greater “threat response” – greater change in skin conductance when viewing “threatening” images and/or higher blink amplitudes when presented with a “threatening” stimulus – were more likely to support the War in Iraq, greater defense spending, capital punishment and “patriotism”¹; those showing a lesser threat response were more likely to support foreign aid, pacifism, liberal immigration policies and gun control. The moral of the story: “The degree to which individuals are physiologically responsive to threat appears to indicate the degree to which they advocate policies that protect the existing social structure from both external (outgroup) and internal (norm violator) threats” (Oxley et al. 2008, 1667).

¹ In fact, this claim, taken directly from the authors' Abstract, is not true according to the their own measurements for two of the items they mention: defense spending and patriotism. See discussion below.

Skin conductance (i.e., sweaty palms), as the authors correctly note, “has been closely linked with the psychological concepts of emotion, arousal, and attention” (Oxley et al. 2008, 1668). That is, skin conductance is a *non-specific* measure of arousal of *any kind*. So what the authors were in fact measuring was any kind of strong emotion, any kind of arousal, or any increase in attention. Skin conductance levels cannot tell a researcher what emotion, and/or what kind of arousal, and/or what kind of change in attention a subject is experiencing. Rage, sexual arousal, joy, fear, disgust, empathy, interest, surprise, all can be manifested by an identical increase in skin conductance levels. So on what basis do the authors conclude that what they were measuring was in fact something appropriately called “threat response”?

The answer, presumably, rests with the “threatening” pictures study participants viewed. That is, the authors assumed that any and every individual who viewed these images would have precisely the same response, i.e., would experience them as “threatening.” But the “obvious” or “natural” response to, e.g., a picture of a leg filled with maggots, is not necessarily to feel “threatened.” In response to this image, any participant might have felt disgust, or perhaps empathy for the plight of the person depicted, or perhaps was simply paying greater (or lesser) attention to the appearance of an unexpected type of image (e.g., a leg filled with maggots in the midst of pictures of bunny rabbits and meadows).

What about the measurement of “startle blink response” as an indicator of level of “threat response”? The startle reflex is a contraction of skeletal and facial muscles in response to a sudden, unexpected and salient stimulus, such as a sudden burst of loud noise. In humans the most robust component of the startle reflex is a rapid eye closure which can be quantified by measuring the electromyographic activity of the orbicularis oculi muscles surrounding the eyes. Are the authors correct in characterizing this as a “fear response”? The startle blink response is a *reflex*. Reflexes are rapid and involuntary responses to stimuli, both features being due to the fact that reflexes operate via a “reflex arc” in which sensory neurons activate spinal motor neurons without the delay of routing signals through the brain. That’s why persons in a vegetative state, lacking all consciousness and higher cognitive functions, can still exhibit a startle reflex (Vanhaudenhuyse et al. 2008). The startle blink reflex, in and of itself, is as much a fear response (to a perceived threat) as the patellar knee reflex is a fear response (to the threat of falling over).

To be sure, reflexes can be modulated or inhibited via a secondary neuronal pathway which sends sensory input to the brain, and it is modulation by affective and attentional states via this secondary pathway that is of primary interest to behavioral psychologists. For example, “fear-potentiated” startle experiments have shown an increase in baseline startle reflex when subjects experience unexpected bursts of white noise upon return to a room where they have previously received unpleasant electric shocks (Pole et al. 2009). But it is simplistic to assume that greater blink amplitude is simply *equivalent* to being in a greater state of fear:

The extensive research on potentiated startle reflex in humans, measured by the magnitude of blink reflex to aversive versus nonaversive pictures, provides an example of the conceptual problems that trail a decision to treat this single response as a valid indicator of a negative affective state...[D]ata suggest that a large startle reflex is mediated by a special state of cortical/cognitive arousal...It is not obvious, however, that this state should be described as negative or as reflecting a semblance of fear or anxiety. An exaggerated blink reflex to an aversive stimulus might, under some conditions and in some individuals, index a state of anxiety, but the magnitude of this reflex, considered alone, is not sufficient to infer a particular emotional state, especially one as general as “negative affect” [or “fear response,” or “threat response”] (Kagan 2003, 323-4)

In addition, there is evidence that a host of transitory emotional and attentional states – being depressed, nervous, bored, distracted – can effect an individual’s blink reflex, in addition to whether or not one takes anti-depressants, smokes cigarettes and/or marijuana, drinks alcohol

and/or coffee, or has the startle reflex measured during cardiac systole or diastole (Schulz et al. 2007; Mneimne et al. 2008; Murphey et al. 2008; Yam et al. 2008; Kedzior and Martin-Iverson 2006). Without correcting for all such individual variations (and doubtless many others) it is difficult to claim any robust correlation between blink reflex and political attitudes.

What I have just considered is the manner in which the authors characterize and measure the physiological component of what they term a “threat response.” Of equal importance, however, is how they identify policies designed to protect the social order against threats, and measure the extent to which participants support such policies. To this end, the authors had subjects fill out a questionnaire adapted from the Wilson-Patterson (WP) index, a measure of level of “conservatism” popular among political scientists. From 29 “issue items” on the WP index, the authors selected 18 policy issues “most likely to be held by individuals particularly concerned with protecting the interests of the participants” group, defined as the United States in mid-2007, from threats” (Oxley et al. 2008, 1668). For each issue item on the WP index, respondents are given “agree,” “disagree,” and “uncertain” as response options. The 18 issue items the authors tested were as follows:

<p>“Agree” response</p> <p>= conservative response (according to the WP index)</p> <p>= support for policy designed to protect the social order against threats (according to the authors)</p>	<p>“Disagree” response</p> <p>= conservative response (according to the WP index)</p> <p>= support for policy designed to protect the social order against threats (according to the authors)</p>
<p>Military Spending</p> <p>Warrantless Searches</p> <p>Death Penalty</p> <p>Patriot Act</p> <p>Obedience</p> <p>Patriotism</p> <p>Iraq War</p> <p>School Prayer</p> <p>Biblical Truth</p>	<p>Pacifism</p> <p>Gun Control</p> <p>Foreign Aid</p> <p>Compromise</p> <p>Pre-marital Sex</p> <p>Gay Marriage</p> <p>Abortion Rights</p> <p>Pornography</p>

The authors insist that they do not label this collection of policy positions either ‘liberal’ or ‘conservative,’ “because we measure only one aspect of ideologies and exclude other aspects such as positions on economic issues.” But they do assume, without further explanation, that *every response which according to the WP index is a conservative policy position, is simultaneously a policy designed to protect the social order against threats.* On the basis of their responses, participants were placed in one of two categories depending upon whether or not they fell above or below the median of responses: “high support for protective policies” and “low support for protective policies.”

As noted, the authors claim that these political positions are held by individuals “particularly concerned to protect the interests of the participants’ group against threats”; at the same time, they define the “participants’ group” as “the United States in mid-2007.” This creates an obvi-

ous difficulty. Both the liberals and conservatives the authors studied are members (citizens) of the United States, and if we take this as the relevant group, they will differ in their views (though certainly not all of them) as to both what is in the interest of, and what constitutes a threat to, the United States. Where they differ, liberals will view conservative views as constituting a threat to the United States, and conservatives will view liberal views as likewise constituting a threat.

The authors do seem to realize this difficulty, if not its full implications, acknowledging the following in the “Supporting Online Material” (Oxley et al 2008b, 6):

The particular collection of issue positions we employ as indicative of a desire to protect existing social structures from both external and internal threats is certainly open to challenge. We welcome further refinements in identifying the specific attitudes that are and are not connected to physiological traits. We recognize that claims can be made that the social unit is protected more by, say, banning warrantless searches and permitting pornography than by permitting warrantless searches and banning pornography but we posit that those favoring warrantless searches and pornography bans are more likely to couch their argument in terms of protecting of the social unit than are those taking the contrary positions (few arguments for permitting pornography contend that doing so will make society stronger while arguments against pornography often invoke the need to prevent the unraveling of the social fabric).

The authors appear here to make the manner in which supporters of contrary political positions “*couch their arguments*” as the touchstone for determining whether or not a given position “really is” indicative of viewing something as a threat. But it is ingenuous, to say the least, to take *political rhetoric* as indicative of whether or not one actually perceives something as a threat to the social order. Nonetheless, the authors maintain, using the example of attitudes toward pornography, that “few arguments for permitting pornography contend that doing so will make society stronger while arguments against pornography often invoke the need to prevent the unraveling of the social fabric.”

But this is not true. What Nadine Strossen, president of the American Civil Liberties Union, says in her book, *Defending Pornography: Free Speech, Sex, and the Fight for Women’s Rights*², is characteristic of liberal defenses of pornography. According to Strossen, right-wing fundamentalists and anti-pornography feminists pose “an unprecedented danger to sexual expression”; America is in the middle of “a full-fledged sex panic” in which artists, intellectuals, and women “are increasingly deterred” from fully exploring their own and other people’s sexuality in words, pictures, and perhaps even deeds. Hence, Strossen “*couches*” her support for pornography (or the right to pornography) in terms of an overwhelming *threat* to free expression, free expression being the hallmark of a social order characterized by First Amendment rights which Strossen is concerned to uphold. And by seeking to defend pornography and First Amendment rights, Strossen believes that she is working to *strengthen* the social order.

Arguments against “warrantless searches” are likewise commonly full of assertions of the dangers such a practice poses to the privacy of citizens, the rule of law, and “American values” in general. Here is an excerpt from a speech by Al Gore on the Bush administration’s program of warrantless wiretapping:

The President and I agree on one thing. The threat from terrorism is all too real. There is simply no question that we continue to face new challenges in the wake of the attack on September 11th and that we must be ever-vigilant in protecting our citizens from harm. Where we disagree is on the proposition that we have to break the law or sacrifice our system of government in order to protect Americans from terrorism. When in fact, doing so would make us weaker and more vulnerable. And remember that once violated, the rule of law is itself in danger. Unless stopped, lawlessness

² New York: NYU Press, 2000

grows. The greater the power of the executive grows, the more difficult it becomes for the other branches to perform their constitutional roles. As the executive acts outside its constitutionally prescribed role and is able to control access to information that would expose its mistakes and reveal errors, it becomes increasingly difficult for the other branches to police its activities. Once that ability is lost, democracy itself is threatened and we become a government of men and not laws.³

And, Gore argues, ending warrantless wiretaps will make society *stronger*: “Vigilant adherence to the rule of law actually strengthens our democracy, of course, and strengthens America.”

The language of threats, and arguments that certain positions either weaken or strengthen the “social order,” permeate all sides of all debates on all social and political issues. What distinguishes those holding differing political views is not where they fall on an imaginary scale of “greater” or “lesser” concern about threats to the social order, but rather, *that they perceive different things as constituting threats to that order*. Many liberals view climate change as a grave threat, while many conservatives do not; conservatives view gay marriage as a threat to the institution of marriage, while liberals do not, but rather, view not allowing it as a threat to the principle of equality before the law; liberals view banning pornography as a threat to free speech, while some feminists view allowing it as a threat to the dignity and safety of women, and some conservatives view allowing it as a threat to the idea that sex should be confined to marriage, or as promoting a socially dangerous promiscuity.

Any perception of a threat to the social order depends critically upon one’s views regarding what the character of the social order *should be* (i.e., depends upon one’s normative commitments), as opposed to what the nature of the given social order “actually is.” For example, the authors identify opposition to abortion and pornography as indicative of a heightened concern to protect the social order against threats. But if by the social order the authors intend the United States in mid-2007, a social order in which abortion is held to be a woman’s constitutional right (ever since *Roe v. Wade*), and in which pornography is held to be a form of protected speech, it is the *supporter* of the right to abortion and the right to pornography who is concerned to protect the social order from “threats” (policies that would alter this aspect of the social order); whereas the opponent of abortion and pornography does not want to protect the current social order from threats, but rather views the current social order as *itself a threat*, and wants to change that order (or return to a previous order).

Whether the authors characterize political opinions as indicative or not of a desire to protect the social order against threats, is foundationally guided by their own political presuppositions (or perhaps biases). They evidently believe that conservative views spring from a heightened fear of threats to the social order, while liberal views do not. Why, one might ask, do the authors classify a belief in Biblical truth as a “policy” designed to protect the social order against threats? Do they equate a belief in the truth of the Bible with biblical literalism and aggressive Christian fundamentalism? Or perhaps they assume that any belief in sectarian religious truth must spring from fear and defensiveness and manifest itself in aggressive anti-liberal political views. And why do they list “patriotism” – “love of one’s country” – as a “policy” designed to protect the social order against threats? Do they assume, perhaps, that all patriots are militaristic xenophobes (such as e.g., Mahatma Gandhi, who characterized himself as a nationalist and patriot as well as a pacifist)?

³ Speech delivered on January 16, 2006, at the Daughters of the American Revolution Constitution Hall in Washington DC. The full text of the speech is available at: http://www.huffingtonpost.com/2006/01/16/the-full-text-of-al-gore_n_13930.html

If what distinguishes liberals and conservatives is not the extent to which they desire to protect the social order against threats, but rather, which things they see as threatening the kind of social order they believe in, then any supposed correlation between heightened physiological “threat response” and heightened concern with threats to the social order vanishes.

To all of this the following objection might be raised. Granted, it is illegitimate to characterize conservative, as opposed to liberal views, as indicating a desire to protect the social order against threats; and granted, what the authors were measuring via skin conductance and startle blink reflex may not have been equivalent to differences in physiological “threat response;” is it not at least interesting, or suggestive, that those holding more “conservative” views showed a greater level of some kind of physiological “responsiveness” to certain kinds of stimuli (setting aside the significant problem of not controlling for factors such as whether a participant drinks, smokes, is depressed, bored, distracted, etc.)?

The problem with this objection is that it is not clear that the authors really found any meaningful correlation between the physiological measurements they employed and level of conservatism (or positions indicating fear of threats to the social order). For example, the authors state in the synopsis that, “individuals displaying measurably higher physiological reactions to those same stimuli were more likely to favor defense spending, capital punishment, patriotism, and the Iraq War.” However, in the “Supporting Online Material,” they assert (Oxley et al. 2008b, 7):

We also ran multiple regression analyses on each of the individual items used to create the additive index of support for protective policies. In these analyses we used the same model specification employed in the main text. In this series of analyses we did find that the physiological variables had stronger predictive capabilities for some items over others. Both SCL for threatening images and mean blink amplitude were statistically significant predictors of attitudes on gay marriage, abortion rights, school prayer, gun control and warrantless searches. Neither variable was a statistically significant predictor for pornography, compromise, patriotism, or military spending (this is not surprising since, as noted in Table S1, attitudes toward pornography, compromise, and patriotism are all extremely lopsided and thus leave minimal variance to explain). For all other items, one of the predictors (SCL for threatening images and mean blink amplitude) was significant, but not the other.

How can it be true *both* that those displaying higher physiological reactions to the same stimuli were more likely to favor defense spending and patriotism, *and* that neither measure was a statistically significant predictor of patriotism and military spending? Be that as it may, the items not correlated include political positions that one might deem central to any measure of conservatism, i.e., attitudes toward *pornography*, *military spending*, and *patriotism*.⁴ At the same time, these attitudes are naturally connected with other attitudes that the authors did find to be correlated (e.g., attitudes toward the Iraq War were correlated while attitudes toward patriotism, military spending, and compromise were not; attitudes toward premarital sex were correlated while attitudes toward pornography were not). If we consider the attitudes individually, it is not at all clear that the authors found any correlations with a meaningful and coherent set of attitudes (whether conservative, liberal, “concerned to protect the social order against threats”, or anything else).

Nor is what the authors say in this regard adequate, i.e., that the reason for the lack of correlation was because of the minimal variance on these issues between the greater and lesser threat groups. Minimal variance would appear to indicate that these attitudes *do not* differentiate between the

⁴ The authors themselves seem well aware of the importance of these attitudes. Why else would they draw prominent attention to them, claiming they were correlated with the physiological measures they employed, when in fact they were not?

high and low support for protective policies groups (since both groups share them). Note, however, the circularity that such a move would entail: Those political positions that can be correlated with a greater physiological “threat response” are indicative of a desire to protect the social order against threats; those that cannot be correlated are not indicative of such a desire.

In sum, the authors support their conclusions through multiple acts of creative and tendentious redescription: They describe all of the relevant physiological and ideological variables as indicating a perception of threat, and then show that they are correlated. This is a textbook example of the fallacy of “misuse of hypothesis” or “persuasive definition”: The authors define and characterize phenomena in a manner favorable to their hypothesis, but with little justification other than to support their hypothesis.

Evan Charney
Duke University
echar@duke.edu

REFERENCES

- Alford, J.R., C.L. Funk, and J. Hibbing. (2005) Are political orientations genetically transmitted? *American Political Science Review* 99 (2): 153–67.
- Kagan, J. (2002) “Behavioral Inhibition as a Temperamental Category,” in *Handbook of Affective Sciences*, ed. R. J. Davidson, K. R. Scherer, and H. H. Goldsmith. Oxford: Oxford University Press.
- Kedzior K. and M. Martin-Iverson. (2006) Chronic cannabis use is associated with attention-modulated reduction in prepulse inhibition of the startle reflex in healthy humans. *Journal of Psychopharmacology* 20 (4): 471-484.
- Lam, C. et al. (2008) Nicotine differentially inhibits the acoustic startle reflex in African American and Caucasian American smokers. *Addictive Behaviors* 33: 1521–1528
- Mneimne, M. et al. (2008) Affective Ratings and Startle Modulation in People with nonclinical depression. *Emotion* 8 (4): 552–559
- Murphey S. E., et al. (2008) Direct effects of diazepam on emotional processing in healthy volunteers. *Psychopharmacology* 199: 503–513
- Oxley, D. R. et al. (2008a) Political Attitudes Vary with Physiological Traits. *Science* 321: 1667-1670.
- Oxley, D. R. et al. (2008b) Supporting Online Material for “Political Attitudes Vary with Physiological Traits.” www.sciencemag.org/cgi/content/full/321/5896/1677/DCI
- Pole, N. et al. (2009) Prospective Prediction of Posttraumatic Stress Disorder Symptoms Using Fear Potentiated Auditory Startle Responses. *Biological Psychiatry* 65 (3): 235-240
- Schulz, A. et al. (2009) Cardiac modulation of startle eye blink. *Psychophysiology* 46 (2): 234 - 240
- Vanhaudenhuyse, A. et al. (2008) Blink to visual threat does not herald consciousness in the vegetative state. *Neurology* 71 (17): 1374-1375.