

Title: The Effects of Exposure to Contention on Voting: The Moderating Role of Individual Differences

Author: Jaime Settle

Intro

Scholars of the political contextual environment have long been interested in the question of whether the distribution of partisans within a geographic context has an effect on participation and preferences of its residents. Environments with very close elections—where there are near equal levels of support for the candidates or parties-- are thought to have higher turnout in the aggregate, whether because of rational voter calculations (Downs 1957, Riker and Ordeshook 1968), increased perceptions of civic duty and social pressure (Blais 2000, Gerber, Green, and Larimer 2010), or strategic behavior on the part of elites (Jacobson and Kernell 1983, Cox and Munger 1989). In short, political competition is thought to increase political participation.

Conversely, another body of work suggests that being exposed to different political viewpoints within one's environment—the very thing we expect to happen in areas with more equal distributions of partisans—may actually have a depressive effect on political participation (Pattie and Johnston, Mutz 2002, Campbell 2006). This pattern of findings creates a paradox: analysis of the aggregate behavior of an electorate in response to political contention does not always align with the proposed mechanisms of the effects of contention suggested by individual level studies.

One potential way out of this paradox is to search for individual-level differences in response to political contention. Indeed, we argue that we can gain more traction on understanding the effect of political heterogeneity on individual voter behavior by considering how individual predispositions moderate the effect of exposure to political contention. In this paper, we leverage genetic heterogeneity between individuals to explore how the effects of the political environment are conditioned on individual differences. Although competitive elections can act to motivate some people to vote, we suggest that it has the opposite effect on people who may be genetically predisposed to be less resilient to the perception of threat. To test this, we conduct both observational analysis and a field experiment to examine the interaction between political environment and the 5HTT gene, which is thought to regulate social stress and activity. For people with a certain variant of this gene, a politically contentious environment presents a threatening environment to which they may respond by disengaging politically and abstaining from voting.

Theory and Hypotheses: 5HTT and Response to Threat

Previous studies offer both theoretical and empirical support for why we might expect both positive and negative effects of political contention on voter turnout. What these studies have in common is that they have almost uniformly ignored the potential role of individual differences that structure response to threat. Studies have shown that genes play an important role in modulating one's sensitivity to stress events. Some individuals may therefore be more easily influenced by political contextual influences due to innate predispositions. Accordingly, we look to genes that have been implicated in stress response and could likely be affected by political contention.

A prime candidate is 5-HTTLPR, a polymorphic region in the SLC6A4 gene that codes for a serotonin transporter. Serotonin is a chemical which is released in the brain when a presynaptic neuron fires. After a neuron fires, it is sensed by receptors on postsynaptic neurons which uptake the serotonin. Sequential firing of neurons after each other carries signals throughout the body. In short, serotonin, is centrally related to individual differences in social functioning. When individuals are confronted with stress – perhaps especially social stress – they are likely to flood the gaps between neurons with excess serotonin. If this serotonin is not taken up by postsynaptic neurons and broken down, it has the potential to oxidize and kill both presynaptic and postsynaptic neurons, further handicapping a cell's ability to handle stress.

The exact role of 5HTT in the regulation and management of stress remains to be elucidated. However, it is among the polymorphisms thought to be related to one's "central sensitivity to the pathogenic effects of the environment" (Kendler 2005; Stein et al 2007). Indeed, Stein et al. (2007) hypothesize that this polymorphism is directly or indirectly related to some aspect of brain functioning "relevant for buffering stress", whether through a very complex mechanism or through something more quantifiable, such as the amount of serotonin available in the brain. One idea is that 5HTT matters through regulating the uptake of excess serotonin. The 5-HTTLPR polymorphism is in the promoter region of the gene and is central in determining this reuptake of serotonin as it acts as a transporter of serotonin across cell walls. Those who have the more efficient allele are better able to reuptake serotonin into a cell where it can then be broken down. Accordingly, those with this more efficient version of the gene are thought to be better able to cope with stressful social situations. The general consensus is that the "long" 528 base-pair allele is more transcriptionally-efficient than the 484 base-pair allele, and studies often compare those who are homozygous for the long allele compared to those who carry any version of the short allele.

Murphy and Lesch (2008) provide perhaps the most comprehensive review on the consequences of variants on 5HTT. Among humans, they note that, "The 5HTTLPR short variant... is strongly associated with anxiety-related, harm avoidant, and negative personality traits in humans" (see also Kendler et al 2005; Grabe et al, 2005; Jacobs et al, 2006; Kaufman et al, 2004, 2006b; Sen et al 2004; Stein et al 2006). Moreover, leveraging knock-out studies in mice, they catalogue a long list of correlates with short alleles. Biochemically, mice with short alleles have been found to have fewer SERT binding sites, lower rates of serotonin uptake and clearance, less serotonin content in the brain, and greater extracellular fluid serotonin and serotonin synthesis. Behaviorally, short alleles are associated with great anxiety, learned fear, learned helplessness, and startle response. It is likewise associated with reduced aggression and exploratory activity.

Taken together, these findings suggest that those with short versions of 5HTT should be more likely to select out of politics when confronted with stress, as they will be less able to successfully manage the contention of politics, arrive at a vote decision, and act on that decision. Accordingly, we empirically expect to see lower rates of participation among those with a short version of 5HTT when they live in a politically contentious environment.

Preliminary Results

Using a unique dataset which combines genetically informative data, validated voter turnout records, and information about the political context in which respondents live, we demonstrate that those who carry the short allele of 5HTT are less likely to vote, but only when confronted with a contentious political environment as measured by living in a precinct where the two major political parties have approximately equal numbers of registered supporters.

The sample is comprised of undergraduate psychology students at San Diego State University recruited between the fall of 1999 and the spring of 2007. These subjects volunteered to participate in a study, were paid for their participation, and gave written consent. The original study was approved by both the University of California, San Diego, and San Diego State Institutional Review Boards. In addition, the study genotyped a majority of the sample for the 5HTT polymorphism. See Stein et al. (2004) for a more detailed description of the sample.

In order to determine whether or not subjects are registered voters, they were matched with public voting records available through the California Secretary of State's office. Voter records are as of June 2009. The matching process for the primary sample utilized available personal information including full name, date of birth, phone number, and email address. We were able to match 74% of the subjects from the sample which is consistent with the fact that 75% of eligible Californians were registered to vote as of the November 2008 election (see <http://www.sos.ca.gov/elections/sov/historical-voter-reg/hist-voter-reg-and-part-general-elections-1910-2009.pdf>). The fact that over 90% of San Diego State students come from within California (<http://asir.sdsu.edu/app/index.cfm>) also likely improved our ability to match subjects to the voter files.

Using the contextual data, we constructed the absolute difference between the number of registered Democrats and Republicans in a precinct in relation to the total number of registered voters. A difference of zero would indicate an equal number of Republicans and Democrats in the precinct, and thus the highest level of heterogeneity, whereas a value of one would mean one-party domination of a precinct. Therefore, we converted the measure so that higher values on the scale indicate higher levels of partisan heterogeneity. The precinct-level measure of partisan heterogeneity we use in this paper is:

$$\text{Partisan Heterogeneity} = 1 - (\text{abs}(N \text{ Registered Democrats} - N \text{ Registered Voters}) / N \text{ Total Registered Voters})$$

To test for an association between the interaction of the short 5HTT allele with partisan heterogeneity and turnout we employed the simple regression:

$$\text{logit}(P[\text{Partisan attachment}=1]) = B_0 + B_1\text{SHORT} + B_2\text{HET} + B_3\text{SHORT}*\text{HET} + B_4\text{Age} + B_5\text{Male} + B_6\text{SP1} + B_7\text{SP2}$$

where SHORT is the incidence of at least one Short 5HTT allele (0 or 1), HET is our measure of partisan heterogeneity, AGE is age in 2008, and MALE is an indicator

variable for whether the subject is male (1) or female (0). SP1 and SP2 are the subpopulation assignments.

Table 1: Logit Regression with Interaction Effect

	Estimate	Std Error	Z-value	P-value
SHORT	4.11	1.41	2.92	0.00
HET	0.83	1.26	0.66	0.51
Age	-0.01	0.04	-0.32	0.75
Male	0.17	0.24	0.73	0.47
SP1	-0.66	0.35	-1.89	0.06
SP2	-0.80	0.46	-1.73	0.08
5HTT*HET	-0.05	0.02	-2.67	0.01
Intercept	1.08	1.44	0.75	0.45
N	565			
Null Deviance	614.29			
Residual Deviance	593.51			
AIC	609.5			

Table 1 demonstrates the key result. This finding refines our previous understanding of the effects of partisan heterogeneity on the decision to vote. For some people, living in a politically contentious environment may very well motivate the act, especially when other factors known to increase turnout—such as candidate incumbency or campaign spending—affect the larger political climate. However, for people susceptible to the effects of threat, political contention acts to dampen turnout and discourage engagement, perhaps as a way to remove oneself from the threatening environment. The consideration that the environment may have heterogeneous effects on people based on individual differences is an important step forward in both studies of genopolitics and personality, but also for scholars interested in studying the political context.

Experimental Manipulation

Our analysis to date consists solely of an observational study and therefore fails to account for the possibility that people self-select into their environments. To better test the interaction between a person’s innate predispositions and an *exogenous* environmental influence, we conducted a field experiment during the 2010 California midterm election in which we randomly assign respondents to a postcard mobilization treatment designed to induce anxiety about political competition in the upcoming election. We anticipate that those people who are genetically predisposed to react to stressful environmental stimuli will disengage from politics when the competitive nature of the election is made salient to them. Analysis of these results is underway.

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