

## **Conservative Brains vs. Liberal Brains** **By Louis Cozolino**

Neuroscience and politics have traditionally occupied distant regions of my mind—I hardly ever think of one when discussing the other. While I find neuroscience fascinating and inspiring, I feel mostly frustrated, sad, or angry when I encounter politics. But I must admit that lately, if I dare watch the news, I’ve been wondering whether conservatives and liberals have different kinds of brains, when I see how difficult it is for individuals from the two camps to engage in a sustained and coherent conversation. Conservatives and liberals seem to be of the same species, speaking the same language, yet their brains appear to be organized in different ways. When I looked further into this, I found three interesting studies that may shed some light on this phenomenon.

### **The Findings**

The first study I could find that examined the neurobiological correlates of contrasting political ideology was “Neurocognitive Correlates of Conservatism and Liberalism” by Amodio, Jost, Master, and Yee, published in 2007. In this study, David Amodio and colleagues at New York University measured the performance of conservatives and liberals on their ability to inhibit impulsive responses during what is called a go/no-go test (similar to the children’s game, Simon Says). The use of this type of task was based on findings from psychologists and political scientists that have shown, on average, conservatives being more “structured and persistent” in their cognitive styles and liberals being more responsive to “informational complexity, ambiguity, and novelty” (p. 1246). Based on this reasoning, it was predicted that liberals would perform better on the go/no-go test because they would be more adaptive in their response to the stimulus and therefore more flexible in their behavioral responses.

The anterior cingulate cortex (ACC), along with the anterior insula cortex, is known to be involved with novelty detection, conflict monitoring, and decision-making. As predicted, the liberal group outperformed the conservative group on the go/no-go task and demonstrated greater ACC activation (Amodio et al., 2007). This study was the first to demonstrate a measurable difference between the brains of liberals and conservatives. The ACC is also involved with neural systems responsible for self-reflective capacity, attachment, and empathy. Could it be that

“bleeding-heart liberals” are more aware of and vulnerable to the needs of others because of their more sensitive anterior cingulates?

Another study, published a few years later, examined the relationship between political ideology and gray-matter volume in the brains of 90 young adults using MRI data (Kanai, Feilden, Firth, & Rees, 2011). The volumetric analysis revealed a correlation between liberal attitudes and larger gray-matter volume in the ACC. The increased gray matter (number of neurons) found among liberals in this study is likely linked to the differences in ACC activation found by Amodio et al. (2007) as described above—the more neurons, the more activity. Kanai et al. (2011) proposed that liberals may have a greater ability to tolerate conflict and uncertainty, allowing them to process social issues in more nuanced ways. Based on these two studies, the ACC is strongly implicated in the differences between these two groups, with liberals looking better than conservatives. At this point I began to wonder whether the authors of these papers were liberals themselves; certainly, I wasn't seeing much of a positive spin on the value of being conservative.

In addition to identifying differences between the two groups in their anterior cingulate, the Kanai et al. study added a new twist by finding that conservative attitudes were correlated with increased gray matter in the right amygdala. There is strong evidence in the neuroscientific literature that a primary function of the amygdala is fear processing, and that the right amygdala and the right cortical hemisphere have evolved to specialize in high levels of arousal related to social interaction, primarily involving terror and shame. Individuals with a larger amygdala, (increased gray matter) are likely to be more sensitive to social fear and more risk-averse. Higher amygdala activation also inhibits functioning of the default-mode network, which becomes active in states of self-reflection and empathy (and in which the ACC also participates). At the cognitive level, higher disposition to anxiety and fear correlate with “black-and-white thinking”, which serves as a protective mechanism to reduce anxiety and a sense of danger.

Another finding of interest in the Kanai et al. study was that conservatives demonstrated greater volume in their left insula than liberals. This may be significant because (a) the insula has been repeatedly implicated in the experience of disgust, and (b) several studies (see, e.g., Inbar, Pizarro, & Bloom, 2009) have shown that conservatives are more easily disgusted than liberals.

The fact that it is the left insula—the hemisphere more involved with relating to others in social situations—makes me wonder if it is a conservative trait to want to hold strangers at a distance, which may be motivated by a need for self-protection.

In the third study I found, Darren Schreiber and his colleagues compared the brain activity of registered Republicans (conservatives) and Democrats (liberals) during a risk-taking task, with fascinating results (Schreiber et al., 2013). While the actual behavior between the two groups did not differ, their brain activity did! Conservatives showed significantly greater activity in the right amygdala. This finding both supports the findings of Kanai et al. (2011) and suggests that when conservatives take risks, they are experiencing a higher level of arousal and a greater sensitivity to threatening stimuli.

## **Discussion**

Taken together, these three studies suggest that conservatives and liberals are characterized by differences in either activation or volume in the ACC, right amygdala, and left insula. These different patterns of activation indicate differences in emotional, cognitive, and behavioral reactions to political issues in line with what the authors of these studies have suggested. In considering these findings and their implications, we have to keep in mind that the scientists performing these studies and interpreting the results are subject to the same ideological biases as the subjects they are studying. On the surface, it might appear that liberals are more socially adaptable than conservatives, but there is a good chance that the university researchers interpreting the results are more likely liberal in their political leanings.

It is interesting that despite having higher levels of anxiety triggered during political discussions, conservatives report greater levels of happiness (Vigil, 2010). It is unclear if this difference reflects greater genuine happiness, a sense of joy because of less ambiguity, or better defenses against anxiety. Does facing the complexities of life with greater awareness of the suffering of others makes it less enjoyable and more stressful? Perhaps from an evolutionary framework, the survival of the whole group requires a certain percentage of individuals to be inured to the needs of “outsiders”.

From the perspective of sociobiology, the tendencies for each of us to have both selfish and altruistic motives has been baked into the genetic cake during the social evolution of mammals. While our internal battles between selfishness and generosity are central to the development of our character, this same conflict is played out in social groups as we develop and negotiate laws, ethical beliefs, and moral values. Perhaps what we see in the culture wars between conservatives and liberals are the two poles of our social identities, both equally important to the species and in constant dynamic tension—a tension that may be necessary to allow humans to adapt to the constantly changing needs and survival concerns of the group as a whole.

As we come to understand ourselves better, it may turn out that our political differences are a natural expression of biodiversity that support our survival over longer spans of time while we tend to focus on one political season at a time. It is likely that bleeding-heart liberals and hawkish conservatives have both served the survival of human groups for uncountable generations. The real question is will these historic tensions within the group still serve us as we face the changing realities for our species and the future of our planet?

### References

- Amodio, D. M., Jost, J. T., Master, S. L., & Yee, C. M. (2007). Neurocognitive correlates of conservatism and liberalism. *Nature Neuroscience, 10*, 1246–1247. doi:10.1038/nn1979
- Inbar, Y., Pizarro, D. A., & Bloom, P. (2009). Conservatives are more easily disgusted than liberals. *Cognition and Emotion, 23*, 1–12. doi:10.1080/02699930802110007
- Kanai, R., Feilden, T., Firth, C., & Rees, G. (2011). Political orientations are correlated with brain structure in young adults. *Current Biology, 21*, 677–680. doi:10.1016/j.cub.2011.03.017
- Schreiber, D., Fonzo, G., Simmons, A. N., Dawes, C. T., Flagan, T., Fowler, J. H., & Paulus, M. P. (2013). Red brains, blue brains: Evaluative processes differ in Democrats and Republicans. *PLoS ONE, 8*(2): E52970. doi:10.1371/journal.pone.0052970

Vigil, J. M. (2010). Political leanings vary with facial expression processing and psychosocial functioning. *Group Processes and Intergroup Relations*, 13, 547–558.  
doi:10.1177/1368430209356930