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Interest in Politics Modulates Neural Activity in the Amygdala and Ventral Striatum

Marta Gozzi,[1,2] Giovanna Zamboni,[1,3] Frank Krueger,[4] and Jordan Grafman[1]*

[1]*Cognitive Neuroscience Section, National Institute of Neurological Disorders and Stroke, National Institutes of Health, Bethesda, MD*
[2]*Dipartimento di Psicologia, Università di Milano Bicocca, Milano, Italia*
[3]*Dipartimento di Neuroscienze, Università di Modena e Reggio Emilia, Modena, Italia*
[4]*Krasnow Institute for Advanced Study, George Mason University, Fairfax, VA*

Abstract: Studies on political participation have found that a person's interest in politics contributes to the likelihood that he or she will be involved in the political process. Here, we looked at whether or not interest in politics affects patterns of brain activity when individuals think about political matters. Using functional magnetic resonance imaging (fMRI), we scanned individuals (either interested or uninterested in politics based on a self-report questionnaire) while they were expressing their agreement or disagreement with political opinions. After scanning, participants were asked to rate each political opinion presented in the scanner for emotional valence and emotional intensity. Behavioral results showed that those political opinions participants agreed with were perceived as more emotionally intense and more positive by individuals interested in politics relative to individuals uninterested in politics. In addition, individuals interested in politics showed greater activation in the amygdala and the ventral striatum (ventral putamen) relative to individuals uninterested in politics when reading political opinions in accordance with their own views. This study shows that having an interest in politics elicits activations in emotion- and reward-related brain areas even when simply agreeing with written political opinions. *Hum Brain Mapp 31:1763–1771, 2010.* © 2010 Wiley-Liss, Inc.

Key words: fMRI; social cognition; emotion; reward; brain imaging

INTRODUCTION

Previous inquiries into the sources of political participation have found that a person's interest in politics—independent of other factors such as education or socioeconomic status—can predict participation in political activities [Verba et al., 1995]. Interest in politics is incorporated in many models of political behavior including those concerned with voting [Verba et al., 1995], political sophistication [Luskin, 1990], and media effects [Krosnick and Brannon, 1993]. Despite recent cognitive neuroscience investigations of political behavior and attitudes [e.g., Amodio et al., 2007; Kaplan et al., 2007; Knutson et al., 2006; Westen et al., 2006], virtually nothing is known about the patterns of brain activity associated with an interest in politics.

To address this issue, we used functional magnetic resonance imaging (fMRI) as participants (either interested or

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*Correspondence to: Jordan Grafman, Cognitive Neuroscience Section, National Institute of Neurological Disorders and Stroke, National Institutes of Health, Building 10, Room 7D43, MSC 1440, Bethesda, Maryland 20892-1440. E-mail: grafmanj@ninds.nih.gov

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uninterested in politics) were thinking about politics. In previous neuroimaging studies about politics, participants were asked to view faces of presidential candidates [Kaplan et al., 2007], associate faces or names of well-known politicians with positive or negative words [Knutson et al., 2006], and reason about information threatening to their own candidate, the opposing candidate, or neutral control targets [Westen et al., 2006]. Here, participants were asked to express their agreement or disagreement with opinions on political matters (e.g., the endorsement of policies promoting universal health care or immigration restrictions).

Under the assumption that affect is an inherent component of interest [Hidi et al., 2004], we predicted that individuals interested in politics, when reading opinions about politics, would show greater activation in limbic and paralimbic brain regions involved in emotional processing, such as the amygdala, the anterior cingulate cortex, and the insula [e.g., Morgane et al., 2005; Phan et al., 2004a,b]. As sharing the same opinions with others is a highly rewarding experience [e.g., Rainio, 1961], we expected that individuals interested in politics (when reading political opinions in accordance with their views) would show increased activity in brain regions involved in reward and positive affective reactions, and namely the mesolimbic-striatal reward system, including the caudate, the putamen, and the ventromedial prefrontal cortex [de Greck et al., 2009; Kringelbach, 2005; Moll et al., 2006].

MATERIALS AND METHODS

Participants

Twenty-six right-handed, native-English-speaking American citizens with no history of psychiatric or neurological disorders (13 women, 13 men; mean age 30.3 ± 6.2 years; mean education 18.6 ± 2.5 years) underwent fMRI. For the purpose of this study,[1] one participant was excluded because a technical failure caused the loss of part of the behavioral data during the fMRI. All participants gave their informed consent and were paid for their participation. The work was approved by the Institutional Review Board at the National Institute of Neurological Disorders and Stroke/National Institutes of Health.

After scanning, participants reported their general level of interest in politics (from 1 = very interested to 4 = not at all interested), the frequency with which they followed politics on newspapers, television, or radio (from 1 = every day to 4 = rarely), and the frequency with which they talked about politics (from 1 = every day to 4 = rarely). These scales have been used in previous national and international political surveys [e.g., Robinson et al., 1999; WVS/EVS, 2006]. The three measures were highly intercorrelated (Cronbach's alpha = 0.86). The measures were combined to form an additive index to capture a collective profile of a respondent's political interest, ranging from 3 (indicating very high interest) to 12 (indicating total disinterest or apathy). We used this index to segregate participants into two groups, interested (mean score: <6; N = 9) and uninterested in politics (mean score: ≥6; N = 16). We chose this cut-off to ensure that participants in the interested group were highly interested in politics. Table I reports demographic (gender, age, education, income) and political (political orientation and party affiliation) characteristics of the two groups. We found no differences between the two groups in any of these variables.

TABLE I. Demographic and political characteristics for the two groups (mean ± SD)

Characteristics	Interested	Uninterested	Sig.
N	9	16	
Gender (M/F)	5/4	8/8	1.00
Political interest	4.2 ± 0.8	7.5 ± 1.5	<0.001
Age (years)	33 ± 7	28 ± 5	0.10
Education (years)	18 ± 3	19 ± 2	0.45
Annual income[a]	3.9 ± 0.6	4.4 ± 0.7	0.12
Political orientation[b]	3.3 ± 1.5	3.9 ± 1.3	0.33
Party affiliation[c]	3.2 ± 1.3	3.8 ± 1.7	0.45

There is a significant difference in political interest between the two groups [$t(23) = -5.85$, $P < 0.001$], indicating that the two groups are clearly apart from one another in terms of interest in politics.

[a]Annual income: from 1 = under $12,000 to 6 = $100,000 or more.

[b]Political orientation: from 1 = extremely liberal to 7 = extremely conservative.

[c]Party affiliation: from 1 = extremely Democrat to 7 = extremely Republican.

Stimuli and Procedure

Stimuli were 80 statements expressing opinions on a variety of political issues such as welfare, economy, political involvement, civil rights, war, and security (e.g., "African American children should get more scholarships"; "The law should strictly control immigration"; etc.). The procedure for the selection of the stimuli and the list of the stimuli can be found in Zamboni et al. [2009].

During the fMRI study, the statements were presented on a screen, one at a time, in two conditions. Each statement was presented once in each condition. In the *judgment* condition, participants indicated whether they agreed or disagreed with each statement. In the *font* condition, they were asked whether the statement was written in Helvetica or Swiss font. In both cases, responses were expressed by pressing a button on a response box. In addition, there was a baseline condition during which participants simply looked at a fixation asterisk. Before entering the scanner, participants completed practice trials to familiarize themselves with the task. The stimuli used in these practice trials were additional statements that were not used in the fMRI study.

[1]This experiment was also designed to investigate the neural-anatomical correlates of the criteria underlying political thinking and these findings are reported elsewhere [Zamboni et al., 2009].

Each trial began with a slide stating the task ("Judgment", "Font", or "Fixation") displayed for 1.6 s. Then, the stimulus (statement or fixation asterisk) was presented and participants had 6 s to respond (except in the case of the fixation condition, when participants simply looked at the fixation asterisk). Next, a blank screen was displayed for a mean of 4 s, jittered from 2 to 6 s in 1-s steps. There were four runs total, each including 50 trials ($N = 20$ judgment trials, $N = 20$ font trials, and $N = 10$ fixation trials). Within each run, the trials of different types were randomly intermingled. Each statement was presented twice, once in the judgment condition, and once in the font condition. For each statement, the order of the conditions was randomly assigned. Statements were never repeated in the same run. The runs were the same for all participants, but the order of the runs was randomized across participants. The key/finger assignments were randomized across participants.

After scanning, participants reported their level of interest in politics (see earlier) and completed self-reported measures of political orientation and party affiliation (Table I). Finally, as it has been proposed that emotion is a function of valence and intensity [Cunningham et al., 2004; Posner et al., 2009; Russell, 2003], we asked participants to rate each political statement presented in the scanner for emotional valence (7-point Likert scale from 1 = negative to 7 = positive) and emotional intensity (7-point Likert scale from 1 = not emotionally intense at all to 7 = extremely emotionally intense).

Image Acquisition and Analysis

The study was conducted using a 3-Tesla GE MRI scanner equipped with an eight-channel receiver head coil. Head motion was restricted using a head strap and foam pads placed around the participant's head. We acquired single-shot, 2D gradient EPI (echoplanar imaging) T2*-weighted images with blood oxygenation level-dependent (BOLD) contrast (TR = 2 s; TE = 30 ms; flip angle = 90°; FOV = 240 mm; 31slices, slice thickness 3 mm without gap; matrix size = 64 × 64; voxel size = 3.75 mm × 3.75 mm × 3 mm). In each run, 297 functional volumes were obtained with slices acquired along the transverse plane, parallel to the anterior to posterior commissural line. High-resolution T1-weighted 3D MP-RAGE structural images were also acquired (TR = 6.1 ms; TE = min full; flip angle = 12°; FOV = 240 mm; 124 slices, slice thickness 1.5 mm; matrix size = 256 × 192 × 124). Using Experimental Run Time System software (Berisoft Cooperation, Frankfurt, Germany), the stimuli were projected onto a screen that participants viewed through a mirror mounted on the head coil of the scanner.

The fMRI data were preprocessed and analyzed using SPM5 (Wellcome Department of Cognitive Neurology, London, UK). The first five volumes in each run were discarded to allow for T1 equilibration effects. Functional images were (i) spatially realigned to correct for head movements; (ii) time-sliced to correct for differences in image acquisition time between slices; (iii) spatially normalized to the EPI template from SPM5; (iv) spatially smoothed (6 mm full-width-at-half-maximum [FWHM]) using a Gaussian kernel to reduce noise.

A general linear model was defined for each participant, including as regressors the two levels of agreement ("agree" and "disagree") for each experimental condition (judgment and font). The event-related design was modeled using a canonical hemodynamic response function. Trials were modeled as events which began at the onset of the stimuli (i.e., just after the instruction, when the political statement appeared). At the first-level analysis, we computed contrasts to identify brain regions associated with participants' agreement or disagreement in the judgment condition (i.e., contrasts agree > disagree and disagree > agree), controlling for the font condition. Resulting images for each participant were entered in second-level random effects analyses. We divided participants into two groups (interested or uninterested in politics) and conducted two sample *t*-tests. This approach is valid for unequal sample sizes in the two groups [Gazzola et al., 2007].

Because the aim of this study was to investigate differences between individuals interested and uninterested in politics, we controlled for liberal or conservative orientation by including political orientation as a nuisance covariate. Gender was also entered as a nuisance covariate, as it has been suggested that women may be less politically interested and informed than men [Verba et al., 1997].

Given our a priori hypotheses, statistical maps at the whole brain level were thresholded at P (uncorrected) ≤ 0.001, with a spatial extent threshold of four contiguous voxels (corresponding to 108 mm^3). We selected a spatial extent threshold of four contiguous voxels based on similar criteria used in other neuroimaging studies investigating social and emotional processing in regions such as the amygdala and the striatum [e.g., Hamann and Mao, 2002].

In addition, small volume family-wise error (FWE) corrections at $P \leq 0.05$ were applied to a priori regions of interest (ROIs) according to our anatomical hypotheses. The ROIs were defined according to the Automatic Anatomical Labeling (AAL) atlas [Tzourio-Mazoyer et al., 2002] as implemented in the WFU Pickatlas [Maldjian et al., 2003, 2004] integrated in SPM5: amygdala ROI, AAL amygdala; anterior cingulate cortex ROI, AAL anterior cingulate; insula ROI, AAL insula; caudate ROI, AAL caudate; and putamen ROI, AAL putamen. The ventromedial prefrontal cortex ROI was the same as used in Zahn et al. [2009].

RESULTS

Behavioral Results

Decisions

Participants accurately performed the font condition, with no differences between the two groups (mean number of

TABLE II. Emotional ratings for the two groups (mean ± SD)

Ratings	Emotional dimensions	Interested	Uninterested	Sign.
Ratings (all)	Emotional intensity	4.59 ± 0.83	4.56 ± 0.91	0.58
	Emotional valence	4.09 ± 1.44	4.17 ± 1.51	0.16
Ratings (agree)	Emotional intensity	4.89 ± 1.02	4.58 ± 1.10	0.008*
	Emotional valence	5.25 ± 1.10	4.97 ± 1.13	0.028*

*$P < 0.05$

errors ± SD; interested group: 1.89 ± 1.76; uninterested group: 1.50 ± 1.21; Mann–Whitney, $z = -0.29$, $P = 0.77$). Because there was no right or wrong answers in the judgment condition, the number of "agree" decisions was counted. There were no differences between groups (mean number of "agree" decisions ± SD; interested group: 41.67 ± 4.67; uninterested group: 43.13 ± 5.50; Mann–Whitney, $z = -0.91$, $P = 0.36$). The proportion of "agree" decisions was 0.52 in the interested group and 0.54 in the uninterested group, indicating that approximately half of the statements were agreed with in both groups.

Response times

A mixed-design ANOVA with two factors, condition (font, judgment) and group (interested, uninterested in politics), showed a main effect of condition on response times ($F(1, 23) = 361$, $P < 0.001$), indicating that participants were significantly faster in the font condition (mean response time ± SD; interested group: 1,311 ± 373 ms; uninterested group: 1,567 ± 664 ms) relative to the judgment condition (interested group: 3,135 ± 355 ms; uninterested group: 3,271 ± 591 ms). We did not find a significant main effect of group ($F(1, 23) = 0.87$, $P = 0.36$), nor a significant condition by group interaction ($F(1, 23) = 0.42$, $P = 0.52$). In addition, we performed a mixed-design ANOVA with two factors, type of decision in the judgment condition (agree, disagree) and group (interested, uninterested in politics). In the interested group, the mean response time ± SD was 3,111 ± 398 ms for the "agree" decisions and 3,173 ± 358 ms for the "disagree" decisions. In the uninterested group, the mean response time was 3,246 ± 575 ms for the "agree" decisions and 3,313 ± 630 ms for the "disagree" decisions. We found no significant main effect of type decision ($F(1, 23) = 1.698$, $P = 0.205$), no significant main effect of group ($F(1, 23) = 0.399$, $P = 0.534$), and no significant type of decision by group interaction ($F(1, 23) = 0.003$, $P = 0.957$).

Ratings

After scanning, participants rated the political opinions presented in the scanner for emotional intensity and valence. The ratings are summarized in Table II. For each political statement, the mean rating of the interested group was compared with the mean rating of the uninterested group. When including ratings associated with both "agree" and "disagree" decisions, emotional intensity and emotional valence did not differ between the two groups. However, when including only ratings associated with "agree" decisions, we found significant differences between the two groups, with ratings of greater emotional intensity and more positive affect in the interested group relative to the uninterested group. Therefore, in the analysis of fMRI data, we focused on the contrast agree > disagree.

Imaging Results

Table III shows regions surviving whole-brain analysis [P (uncorrected) ≤ 0.001, 4 voxels] for the contrast agree > disagree in the interested relative to the uninterested group. Two areas survived $P \leq 0.05$ small volume correction (FWE) over a priori ROIs—amygdala and ventral putamen (Fig. 1).

TABLE III. Areas significantly activated for the contrast agree > disagree in the "interested in politics" group relative to the "uninterested in politics" group

Brain region	Hemisphere	MNI coordinates	Cluster size	*t* value
Amygdala	R	24, −3, −18	4	4.05*
Putamen	R	24, 15, −3	28	3.88*
Anterior middle temporal lobe (BA 21)	L	−48, 9, −30	5	4.54
Midbrain	R	6, −30, −6	5	4.10
Lateral orbitofrontal cortex (BA 10)	L	−36, 45, 0	9	3.98

The table shows all brain regions surviving P (uncorrected) ≤ 0.001 in the whole brain analysis with an extent threshold of four contiguous voxels. Only regions which additionally survived a family-wise-error (FWE)-corrected threshold of $P \leq 0.05$ over a priori regions of interest (ROIs) are marked with * and discussed in the text. BA, Brodmann's area; L, left; R, right.

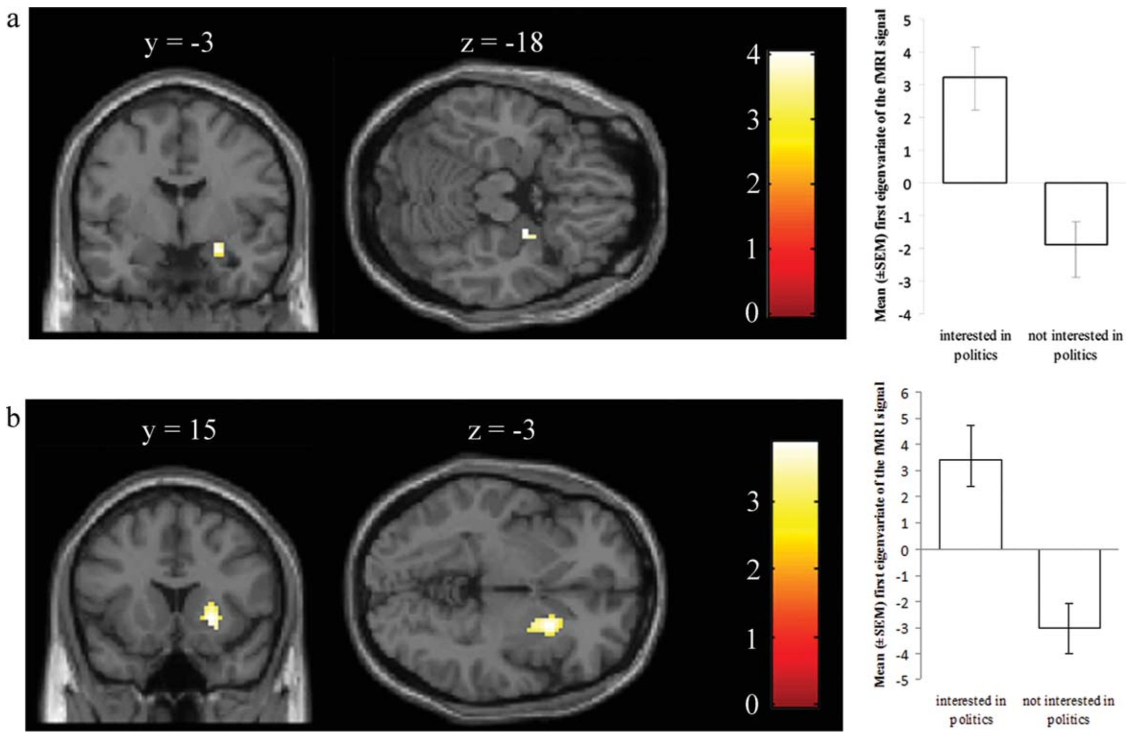

Figure 1.

Activations in the interested relative to the uninterested group for the contrast agree > disagree. Activation maps (thresholded at P (uncorrected) $\leq$ 0.001, four voxels) are superimposed on SPM5's canonical single subject T1 image. The bar plots were obtained by extracting the first eigenvariate of the fMRI signal from a 10-mm sphere centered around the group peak voxel. (**a**) Activation in the amygdala (coordinates of group peak voxel: 24, −3, −18). (**b**) Activation in the ventral putamen (coordinates of group peak voxel: 24, 15, −3).

Given that we had a political interest index for each subject (the sum of the three scores on the self-report measures), we performed correlation analyses to verify whether activation in the amygdala and the ventral striatum (ventral putamen) correlated with political interest (Supp. Info. Fig. 1). For each individual, we extracted the first eigenvariate of the fMRI signal from a 10-mm sphere centered around the group peak voxel (amygdala, coordinates of group peak voxel: 24, −3, −18; ventral putamen, coordinates of group peak voxel: 24, 15, −3) and performed Pearson's correlation analyses with the political interest index. We found that activity in the amygdala negatively correlated with the political interest index (r = –0.488, P = 0.013). Since in the political interest index the lower the sum, the higher the political interest, this result indicates that increased activation was associated with increased political interest. Similarly, we found that activity in the ventral striatum (ventral putamen) is negatively correlated with the political interest index (r = –0.423, P = 0.035), indicating that increased activation was associated with increased political interest.

Additional analyses of activity in the amygdala (Fig. 2) show that in the interested group, the positive difference between agreement and disagreement is due to an increased activation above baseline for agreement compared to disagreement. In the uninterested group, the negative difference between agreement and disagreement is due to an increased deactivation for agreement compared to disagreement. Interestingly, the amygdala is activated (versus baseline) only when interested subjects agree with the political statements they read, whereas it is deactivated (although remains very close to the baseline as shown by the contrast estimates) in all the other conditions.

Additional analyses of activity in the ventral striatum (Fig. 2) show that in the interested group, the positive difference between agreement and disagreement is due to an increased activation above baseline for agreement compared to disagreement. In the uninterested group, the negative difference between agreement and disagreement is due to an increased activation above baseline for disagreement compared to agreement.

We found no regions surviving whole-brain analysis at the threshold of P (uncorrected) $\leq$ 0.001 for the contrast disagree > agree in the interested relative to the uninterested group. No significant activation at the chosen level of significance was found for the uninterested relative to

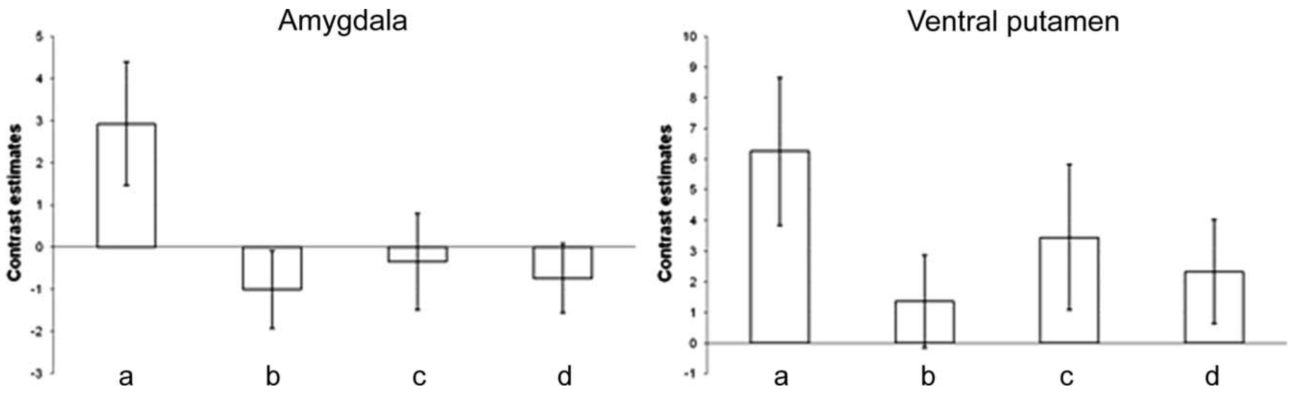

Figure 2.

Mean contrast estimates (± standard error) for the amygdala (coordinates of group peak voxel: 24, −3, −18) and the ventral putamen (coordinates of group peak voxel: 24, 15, −3). Values are displayed for each condition versus fixation baseline: (**a**) agreement in the judgment condition vs. fixation baseline in interested compared to uninterested individuals; (**b**) agreement in the judgment condition versus fixation baseline in uninterested compared to interested individuals; (**c**) disagreement in the judgment condition vs. fixation baseline in interested compared to uninterested individuals; (**d**) disagreement in the judgment condition versus fixation baseline in uninterested compared to interested individuals.

the interested group. Additional analyses regarding the contrast judgment > font are reported in Supporting Information Table I.

DISCUSSION

The aim of this study was to test whether interest in politics (independent of gender or political orientation) affects patterns of neural activity when individuals think about politics. Using fMRI, we scanned healthy volunteers (interested or uninterested in politics) while they were expressing their agreement or disagreement with political opinions. Our behavioral data showed that those political opinions participants agreed with were perceived as more emotionally intense and more positive by individuals interested in politics relative to individuals uninterested in politics.

In line with the behavioral results, we found that participants interested in politics showed greater activity in the amygdala than participants uninterested in politics when reading political opinions in accordance with their views. Some previous lesion and neuroimaging studies have focused on the role of the amygdala in the processing of negative stimuli, such as fearful expressions [e.g., Adolphs et al., 1994; Phillips et al., 1997]. However, other studies have demonstrated that the amygdala responds to positive stimuli and negative stimuli [e.g., Hamann et al., 1999; Small et al., 2003], suggesting that the amygdala is more generally involved in the relevance and/or emotional intensity of the stimuli, regardless of their valence [Phan et al., 2004a,b; Sander et al., 2003]. Indeed, a patient with bilateral amygdala damage rated valence of stimuli similar to controls, but gave quite different ratings of the emotional intensity of these stimuli [Adolphs et al., 1999]. In addition, Hamann and Mao [2002] found that the amygdala is involved in emotional reactions elicited by both positive and negative emotional words (e.g., "thrill," "suicide"). Finally, Cunningham et al. [2004] asked participants to make either good–bad judgments (evaluative) or abstract–concrete judgments (not explicitly evaluative) about words expressing socially relevant concepts (e.g., "murder", "happiness"). Amygdala activation correlated with emotional intensity in both tasks. Thus, we suggest that our finding of increased amygdala activity in individuals interested in politics for political opinions in accordance with their views may be related to an increased emotional intensity associated with the sense of belonging to a social group and/or the importance of their beliefs to constructing a positive sense of self. We cannot differentiate clearly whether amygdala activation in our study reflects primarily the valence or the emotional intensity of the stimuli, as individuals interested in politics (compared to uninterested) rated the statements they agreed with as both more positive and more emotionally intense.

We also found that interest in politics was associated with greater activity in the ventral striatum (ventral putamen) when participants considered statements in accordance with their own views. Previous literature involving humans and animals has demonstrated that the striatum is implicated in reward and positive affect [e.g., Elliott et al., 2003; Knutson et al., 2000; Mitterschiffthaler et al., 2007; Schultz, 2000]. Activity in the striatum was found in response to food, sex, drugs and money [Moll et al., 2005; O'Doherty et al., 2002; Schultz et al., 1997; Tanaka et al., 2004]. The striatum was also activated by viewing sport cars [Erk et al., 2002] or donating to societal causes [Moll et al., 2006]. Here, we found activity in the striatum in

individuals interested in politics for political opinions in accordance with their views. This suggests that political beliefs may share anatomical systems of reward reinforcement with other kinds of natural and artificial stimuli. Furthermore, the striatum, including putamen, globus pallidus, and caudate nucleus, is involved in the long-term pair bonding between adults [Bartels and Zeki, 2000] and in the attachment between mother and child [Bartels and Zeki, 2004]. Therefore, activation of the putamen in our study may reflect feelings of social attachment and affiliative reward.

In addition to the amygdala and the ventral striatum, we predicted activation in other brain regions, including the insula, the anterior cingulate cortex, and the ventromedial prefrontal cortex. The lack of significant activation in these regions may be attributed to the stimuli (we presented statements expressing political opinions, which could be more cognitively and affectively complex than the words used by Posner et al., such as *pleased* and *unhappy*, and by Cunningham et al., such as *love* and *murder*), or the analyses (we computed the contrast agree > disagree, thus excluding all brain regions equally activated when agreeing and disagreeing with the stimuli). In addition, the task details and the scanning protocol, combined with a relatively small number of subjects, could contribute to the overall results and highlight the need for further studies.

Our study differs from previous neuroimaging studies about politics in the choice of the stimuli. Although most studies used faces, names, or information related to politicians, we focused on political opinions. We made this choice because our goal was to test whether interest in politics modulates neural activity when considering positions on political issues, whereas attitudes towards politicians might be more affected by their physical appearance, gender, race, etc., than their positions on political matters [McGraw, 2003]. A recent study has shown that rapid judgments of competence-based solely on the facial appearance of candidates can affect voting decisions [Ballew and Todorov, 2007]. It is currently unclear whether an interest in, and knowledge of, political ideas and opinions is trumped by the surface features of political representatives when it comes to deciding upon political candidates.

Although our study demonstrates that political interest modulates brain responses in the amygdala and ventral putamen to sentences expressing political beliefs, we realize that future studies will be required to clarify whether these effects are specific to politics or hold for other belief systems in which a person has an interest, such as religion. Recently, our group [Kapogiannis et al., 2009] conducted a multidimensional scaling study to determine the psychological components underlying religious belief and evaluated their neural correlates by employing a parallel functional neuroimaging study. The results revealed three psychological dimensions of religious belief, which were localized within networks processing Theory of Mind regarding intent and emotion, abstract semantics, and imagery. A direct comparison of religious and nonreligious subjects did not reveal differences for any of the parametric modulators. However, a nonparametric analysis revealed an effect of disagreement (compared to agreement) for religious (compared to nonreligious) participants. This and other studies, coupled with the current results, will help us better understand what is characteristic of the "political brain," what is in common with beliefs systems concerning other (social or otherwise) objects, and what is due to interest and motivation in general.

Notably, our results cannot be attributed to demographic or political factors such as gender and political orientation. The two groups did not differ in demographic (gender, age, education, income) or political characteristics (political orientation and party affiliation). In addition, gender and political orientation were included as nuisance covariates in the fMRI data analyses, allowing us to control for their potential confounding effect. Although our subjects were mostly "politically moderate" (Table I), future research could recruit a larger and more politically diverse group of participants and investigate the influence of liberal versus conservative orientation on the effects found in this study.

CONCLUSION

In conclusion, our findings provide evidence that having an interest in politics elicits activation in emotion- and reward-related brain areas even when simply agreeing with written political statements. Our results revealed that reading political opinions participants agreed with was associated with significantly more activations in the amygdala and ventral striatum in individuals interested in politics relative to individuals uninterested in politics. Previous literature and post scanning measures suggest that these activations may reflect the emotional intensity and reward felt by people interested in politics when reading political opinions in accordance with their views. An interesting question for future research is whether patients with lesions in the amygdala or striatum exhibit changes in political interest or political behavior, with important implications for the political and social life of those individuals. Another intriguing possibility for future research would be whether neural responses to political opinions could be used to predict engagement in politics, infer the strength of political opinions, and determine the effects of efforts to influence political behavior.

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