Table 1

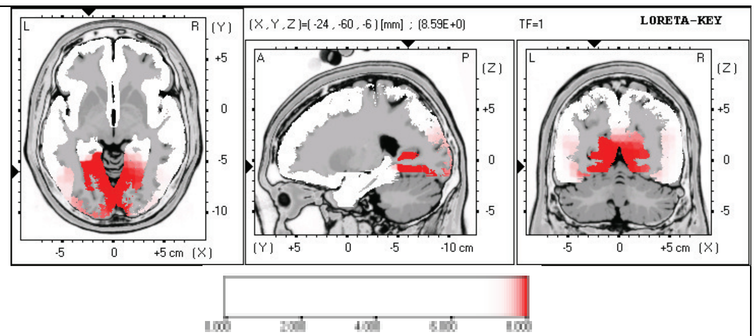
	Brain Structure	Brodmann Area	Talaraich Coordinates
Primary	Lingual Gyrus	19	X= -24, Y= -60, Z= -6
Secondary	Fusiform Gyrus	18	X= -24, Y= -81, Z= -13

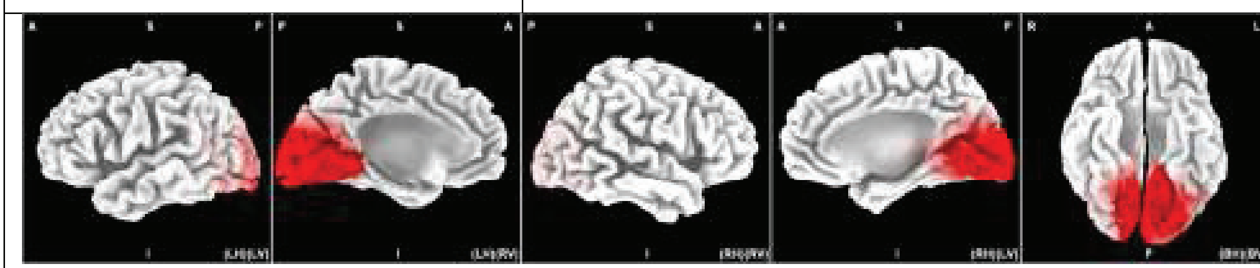
Summary of localization findings for the maximal electrical activity for both FCA and DCA conditions.

The Talairach coordinates with the maximum increase in energy between the FCA condition and the resting state was at X= -24, Y= -60, Z= -6 with a t-value of 8.59 and is significant at p = 0.0. In its most functional state, when compared to a resting state, conation was found to use a smaller or specific amount of energy in the brain, and the ROI encompassed a total of only 100 voxels, or 4% of all 2,394 voxels. Figure 2 shows where the net brain activity occurred when participants were induced to strive toward a goal using the materials according to their natural conative strengths.

Figure 2

LORETA images showing the cumulative representation of the significant differences between the FCA condition and the resting state in all frequencies. Red indicates the ROI and represents an increase in electrical activity in 100 voxels; 4% of all voxels. The maximal activity is at (X= -24 , Y= -60 , Z= -6) BA 19 and 18, Lingual Gyrus and Fusiform Gyrus ($p <= 0.0000001$; $t_{crit} >= 8.0$)



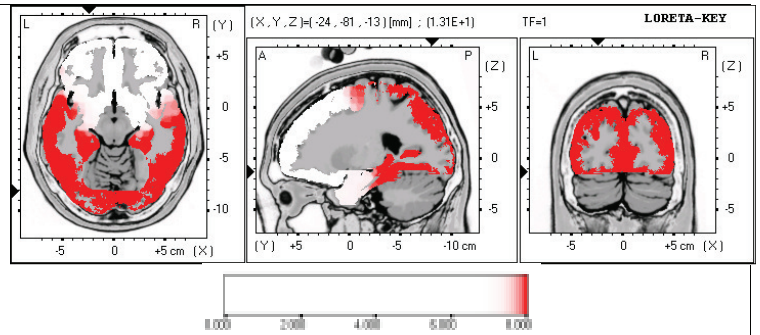


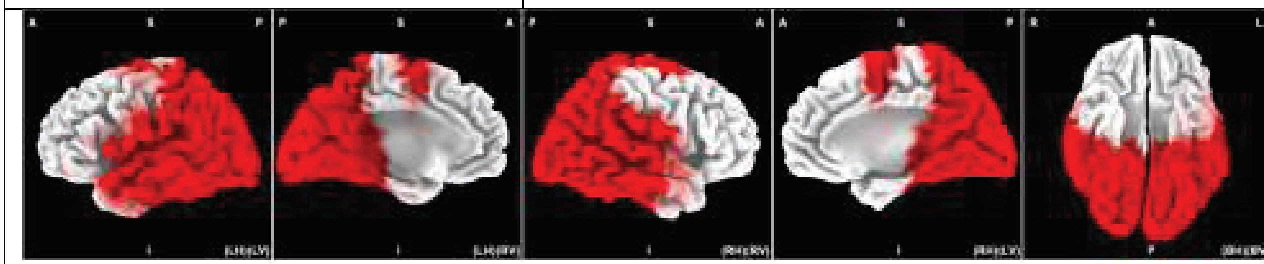
Structural anatomy is shown in gray scale (A anterior, P posterior, S superior, I inferior, LH left hemisphere, RH right hemisphere, BH both hemispheres, LV left view, RV right view, BV bottom view).

The Talairach coordinates with the maximum increase in energy between the DCA condition and the resting state was at X= -24, Y= -81, Z= -13 with a t-value of 13.10 and is significant at p = 0.0. For the DCA condition, when compared to a resting state, the amount of energy activation was greatly increased. While it originated in the same area in the brain, the energy spread out from that location, using a great deal more energy. When participants were required to operate contrary to their innate conative strengths, a total of 1151 voxels were activated, or 48% of all 2,394 voxels. This is a 12 fold increase in activity over the FCA condition. Figure 3 shows where the net brain activity occurred when participants were induced to strive toward a goal using the materials in a manner contrary to their natural conative strengths.

Figure 3

LORETA images showing the cumulative representation of the significant differences between the DCA condition and the resting state in all frequencies. Red indicates the ROI and represents an increase in electrical activity in 1151 voxels; 48% of all voxels. The maximal activity is at (X= -24 , Y= -81 , Z= -13) BA 19 and 18, Lingual Gyrus and Fusiform Gyrus ($p <= 0.0000001$; $t_{crit} >= 8.0$)





Structural anatomy is shown in gray scale (A anterior, P posterior, S superior, I inferior, LH left hemisphere, RH right hemisphere, BH both hemispheres, LV left view, RV right view, BV bottom view).

Discussion

Early brain studies of conation presumed it originated in a region behind the frontal lobe in the supplementary motor area (Goldberg, 1985). However, the results of this study suggest a different location for the origination of this specific conative activity in the brain. We found when individuals were engaged in tasks congruent with their conative strengths, did not find them to be stressful, and were satisfied with their efforts, there was a corresponding region of electrical activity in the Lingual Gyrus and Fusiform Gyrus; an area in the back lower portion of the brain. When those same individuals were presented tasks that were contrary to their conative strength they reported a great deal of stress and dissatisfaction with their efforts, which corresponded with activity originating in the same area, however, there was a wide dispersion of excessive energy expended. In short, when they engaged in purposeful conative activity a degree of brain energy was used; however being forced to work against their conative grain created a high degree of stress and excessive activation of brain energy. Yet this increased activity resulted in dissatisfaction with their efforts. Therefore, we believe conative stress results in an inefficient allocation of brain resources.

Insights emerging from this mapping of intrinsic brain activity have provided us a framework for understanding functional and dysfunctional aspects of behavior as neuropsychological efficiencies and inefficiencies. From this arise many questions and areas to consider for future research. As such, two types of issues emerge; those related to conative stress and those related to physical and mental health domains.

Indications are that working against their conative grain leads human beings to stress-related problems. Studies need to be done on the impact of such conative stress and on methods for reducing both the causes and the negative effects of it. Does the inefficient use of the brain when