



# Does Brain Activity Differ Between The Genders?

## *Beyin Aktivitesi Cinsler Arasında Farklı mı?*

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Studies regarding creative thinking and social behaviors of different genders have been subject to mainly psychological and psychiatric researches for many years. During the last decade neuroscientist have also entered the field and shown a great interest in this topic. Functional imaging studies are widely used for this purpose. In a recent study, Ingalhalikar M et al. investigated 949 young subjects (aged 8-22, 428 males and 521 females) in the course of development using diffusion tensor imaging and found noticeable brain connectivity differences between the sexes (3). Males had greater within-hemispheric activity in all supratentorial regions while females showed predominantly between-hemispheric connectivity (Figure 1A,B). In contrast, cerebellar activities were found to be reversed. The authors concluded that these results may indicate that brain activity is dissimilarly distributed between genders with males showing more perception and coordinated action activity and females prone to communicating with analytic and intuitive processes.

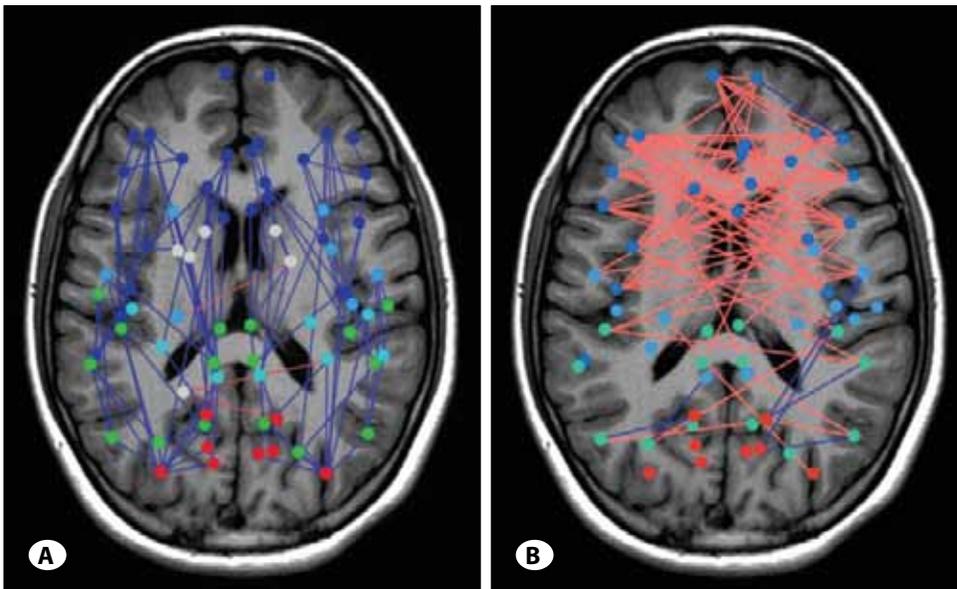
In another study Abraham et al. focused on behavioral aspects of brain activity in both genders (1). They found that while behavioral performances did not differ between genders, the brain regions and pathways used in these acts were distinct. When carrying out tasks, brain areas related to semantic

cognition, rule learning and decision making were more prominent in men, whereas women showed higher activity in regions related to speech processing and social perception.

Gender difference regarding brain activity is apparent even in the resting state. One study conducted with resting fMRIs showed that men experienced increased functional connectivity (FC) in the parietal and occipital regions, whereas women experienced a higher resting state FC in the frontal and temporal regions and in the cerebellum (2).

### REFERENCES

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3. Ingalhalikar M, Smith A, Parker D, Satterthwaite TD, Elliott MA, Ruparel K, Hakonarson H, Gur RE, Gur RC, Verma R: Sex differences in the structural connectome of the human brain. *PNAS* 111:823-828, 2014



**Figure 1:** Brain MRI showing overall analysis of prominent brain activities in different genders when processing similar tasks. **A)** Males have increased intrahemispheric brain activity, **B)** Females mostly have interhemispheric brain activity (based on reference 3).