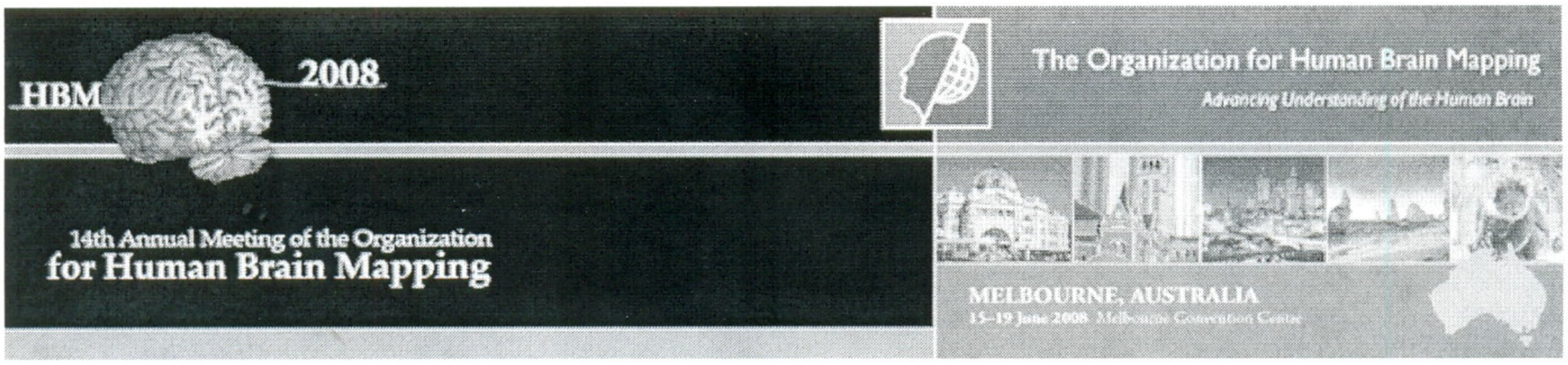

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Neurocognitive basis in experiencing compassion: A gender approach

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Introduction: Gender differences are reported in neurocognitive processes related to emotional experiences and moral reasoning. Women are more empathic in conflict resolution and men manifest lesser activation of brain areas related to empathy when observe an unfair person receiving pain [1]. Compassion belongs to a category f emotions related to moral judge, is elicited by the perception of other´s suffering and motivates help the suffering party [2]. In a recent investigation, women reported a qualitative similar but more intense compassionate experience than men when viewing pictures representing suffering [3]. In this study we tend to identify the coherence of such gender behavioral differences related to compassion and their nenurobiological substrate.

Methods: Sixteen right handed volunteers (8 women and 8 men, 28 ± 3 years old) participated in this study after informed written consent. SCL-90 test was applied to identify mental disorders. Functional images were acquired using a 3.0 T G.E. scanner, applying a BOLD EPI-GRE protocol: TR 3000 ms, 30 slices, 5 mm thick. During the imaging session one series of 100 validated pictures [3] selected from IAPS [4] were projected using the IFIS system, in an event-related functional magnetic paradigm. 14 compassionate pictures presented among 76 social neutral pictures. Eight subjects (4 male and 4 female) were instructed to indicate with their right index finger the presence of compassionate feelings by using a button-finger response when viewing each picture. The other 8 subjects were instructed to indicate the compassionate feeling in the same manner but by moving their left index finger. After acquisition all images were transferred to off line work station with SPM5, where they were time shifted, realigned, spatially normalized and smoothed. Contrasts between conditions of interest were assessed with FEW correction with 0.05 level. The TDC (RIC, University of Texas Health Science Center) was used to acquire the specific Brodmann areas and region associated with the activity clusters.

Results: We found gender differences in the brain activation related to the experience of compassion. Men showed activation in the left prefrontal cortex only (figure 1-B), while women manifested activation in subcortical areas related to emotional experience (parahippocampal gyrus, insular cortex, anterior and posterior cingulated cortices), aversive memory, cognitive control, and decision making (temporal pole, prefrontal and orbitofrontal areas) (figure 1-A).

Conclusions: Neural correlates of finger movement showed that both, the 8 right and the 8 left finger responders, manifested activation in the specific contralateral motor regions. Cortical areas are related to cognitive processes in moral judgments, semantic concepts and attribution of intentionality. Subcortical activation presented in women may imply social skills required to response of offspring needs and differential cultural expectations [5].

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