Heterochrony of Ageing of Adult Cerebral Hemispheres and Relationships with Emotion Function, Mood and Social Engagement

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This thesis is presented in partial fulfilment of the requirements for the degree of Doctor of Psychology, Murdoch University, 2006.
I declare that this thesis is my own account of my research and contains as its main content work which has not previously been submitted for a degree at any tertiary educational institution.

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John P. FitzGerald
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Abstract

A number of studies have suggested that the right cerebral hemisphere declines, functionally, more rapidly, and to a greater degree, than does the left hemisphere, as the human adult ages. Furthermore, research has suggested a possible link between age by gender-related changes in cognitive function and changes in mood and levels of social engagement.

Importantly, a literature search identified that no previous study has employed a divided visual field experimental technique, where emotionally valenced verbal stimuli have been presented, in order to test whether selective impairment of right cerebral hemisphere functioning is associated with normal adult ageing. Nor has any study investigated associations between age, gender, levels of social engagement, mood, and performances in the perception of both emotionally valenced verbal stimuli and facial affect.

The present study investigated whether a selective impairment of right cerebral hemispheric cognitive functioning, in relation to emotion perception, is associated with normal adult ageing. In addition, the present study explored whether any relationships exist between an age-related...
and/or age by gender-related right cerebral hemispheric cognitive impairment, problems with mood, and deficits in social engagement. Two divided visual field experiments were conducted: one divided visual field experiment employed verbal stimuli, and the other, facial image stimuli. These two experiments attempted to assess changes, with adult ageing, in hemispheric specialisation for the perception of emotion by tachistoscopically presenting valenced (positive, neutral, or negative) verbal and facial image stimuli, within a divided visual field experimental paradigm. The studies were conducted across two groups (an old group and a young group of subjects), whilst controlling for gender, handedness and verbal ability of subjects. The dependent variables in these two experiments were the subjects’ reaction times to the stimuli, accuracy of identification of the emotional valence of the stimuli, and response biases to these stimuli.

The data derived from the verbal divided visual field and facial image divided visual field experiments did not indicate any changes in relation to the laterality of emotion perception as the adult human being ages. Importantly, though, the results from both of the aforementioned experiments revealed that the older group of subjects responded more slowly and less accurately to the emotionally valued stimuli than did the
younger group of subjects, suggesting that deficits in emotion perception occur with adult ageing.

In addition, the results suggested age by gender-specific relationships, whereby an overall lowering in cognitive ability for older men was associated with a lowering in ability to accurately perceive the emotional valence of the stimuli. For older women it was found that a lowering in cognitive ability largely mediated by the left cerebral hemisphere was associated with a lowering in ability to accurately perceive the emotional valence of the stimuli, whilst cognitive ability for young persons was not associated with this variable. The data also suggested that for the young women, a heightened level of cognitive ability largely mediated by the left cerebral hemisphere was associated with a lowering in satisfaction with their level of social interaction, whereas a heightened level of cognitive ability largely mediated by the right cerebral hemisphere was associated with a heightened level of mood disturbance.

Gender-specific relationships were also found, whereby for both the older and younger women, a heightened level of mood disturbance was associated with a lowering in satisfaction with their level of social interaction, whilst for both the older and younger men these variables had no relationship.
Furthermore, an age by gender-specific relationship was revealed, whereby for the older men, a heightened level of satisfaction with their level of social interaction was associated with a heightened level of social engagement, whilst for the young men, and both the young and older women, these variables had no relationship.
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